



SERVICE MANUAL

MARINE RADAR

MR-40

DANGER! HIGH VOLTAGE

HIGH VOLTAGE WARNING

High voltages of up to hundreds of thousands of volts are used in this unit. BEWARE of high voltage when removing the outer cover of the unit. When working on the interior, avoid direct contact with the high voltage circuitry especially on the CRT unit and the transmit circuit.

Electric shock of 1000 volts or more causes instant electrocution and death; and, even an electric shock of only 100 volts can kill you.

PREVENTING ELECTRIC SHOCK

After removing the scanner cover, immediately discharge completely the capacitor with a screwdriver according to the procedure on page 6-1. Failing to discharge the capacitor will result in electric shock.

FIRST AID IN CASE OF ELECTRIC SHOCK

A stable foothold is essential to prevent more extensive or additional injuries. When injured by electric shock, disinfect the burn completely and begin first aid as soon as possible. To avoid electric shock, all adjustments should be made using an insulated turning tool.

ORDERING PARTS

Be sure to include the following four points when ordering replacement parts:

1. 10-digit order numbers
2. Component part number and name
3. Equipment model name and unit name
4. Quantity required

<SAMPLE ORDER>

1130005040	IC	HM50464RP12ML	MR-40	MAIN UNIT	5 pieces
8810001040	Screw	PH B0 M2.6 x 6	MR-40	FRONT UNIT	10 pieces

Addresses are provided on the inside back cover for your convenience.

REPAIR NOTE

1. Make sure a problem is internal before disassembling the unit.
2. **DO NOT** open the unit until the unit is disconnected from the power source.
3. **DO NOT** force any of the variable components. Turn them slowly and smoothly.
4. **DO NOT** short any circuits of electronics parts. An insulated turning tool **MUST** be used for all adjustments.
5. **DO NOT** keep power ON for a long time when the unit is defective.
6. **READ** the instructions of the test equipment thoroughly before connecting equipment to the unit.

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SECTION 1 SPECIFICATIONS

■ General

- Minimum range : 25 m (when measurement range is 0.25 nm)
- Maximum range : 24 nm (when measurement range is 24 nm)
- Measurement range :

Range (nm)	0.25	0.5	1	2	4	8	16	24
Ring (nm)	0.125	0.25	0.25	0.5	1	2	4	6

- Preheat time : 2 min.

■ Scanner unit

- Type : Center-feed slot array
- Revolution speed : Approx. 24 r.p.m
- Beam width : Horizontal beam 4° at -3 dB point
Vertical beam 22° at -3 dB point
- Side lobe : - 25 dB
- Polarization : Horizontal
- Transmission frequency : 9410 MHz ± 30 MHz (X band)
- Peak output power : 3 kW
- Pulse width : For 0.25, 0.5, 1.0 range
0.065 μsec./1400 Hz
For 2, 4, 8, 16, 24 nm range
0.65 μsec./700 Hz
- Transmit/receive : Circulator switching
- Intermediate frequency : 60 MHz
- IF passband width : 3 or 8 MHz
- IF circuit characteristics : Linear
- Antenna length : 554 mm; 21.8 in
(Projections not included)
- Dimensions (radome) : 607(φ) x 243(H) mm; 23.9(φ) x 9.6(H) in
(Projections not included)
- Usable temperature range : - 10°C ~ + 60°C (+ 14°F ~ + 140°F)
- Weight : 8 kg ; 17.6 lb (without cable)

■ Display unit

- System : Raster scan method
- CRT display : 9-inch green display
- Pixels : 512 x 512 dots (262144 pixels)
- CRT mounting : Vertical
- Input : NMEA0182 or NMEA0183 format (for navigation receiver)
N + 1 Data format (flux gate compass sensor)
- Output : Alarm zone output (relay)
- Power supply requirement : 11 ~ 40 V DC
- Power consumption : Approx. 50 W
- External alarm current : Less than 1 A (120 V DC), 0.5 A (240 V DC)
- Usable temperature range : - 10°C ~ + 60°C (+ 14°F ~ + 140°F)
- Relative humidity : Less than 95% at 35°C
- Weight : 6.7 kg; 14.8 lb

All stated specification are subject to change without notice and obligation.

SECTION 2 CIRCUIT DESCRIPTION

2-1 SCANNER UNIT

A scanner unit consists of a radome (radar dome), an aluminum die cast frame, a slot antenna, an antenna rotating mechanism, and a waveguide.

The radome is a center-feed slot waveguide array. Horizontal beam width is 4° and vertical beam width is 22° . A motor-encoder rotates the slot antenna using a geared motor. A motor control circuit on the IF unit keeps the rotation steady.

The aluminum die cast frame is treated with an anti-corrosive.

2-2 PA UNIT

The PA unit consists of a line-type pulser using SCR, an SCR control, a magnetron heater, and magnetron current monitor circuits.

The PFN (pulse forming network) circuit is switched by long or short pulse width. RL1 is controlled by the [RANGE] key on the front panel. High voltage from the modulator is applied to C10, C11, C12, C21 and L3 at the long time pulse width (0.65 μ sec/700 Hz), and C10 and L4 at the short time pulse width (0.065 μ sec/1400 Hz).

High voltage supplied from a DC/DC converter (Q1, Q2, T1) resonates L2 and PFN and is charged 2 times at PFN. A trigger pulse from a waveform shaper (Q3, Q4) conducts an SCR (silicon controlled rectifier) switch. The voltage which is charged at PFN capacitors is discharged through a pulse transformer (T2) and is applied to the magnetron. When the discharge is finished, SCR is turned OFF and the procedure is repeated.

Q5 and Q6 are protector circuits which protect the magnetron heater circuit.

The magnetron current monitor consists of D8 and a peripheral circuit. Magnetron performance can be checked at check point 5 (CP5).

2-3 IF UNIT

The IF unit consists of an IF frequency amplifier, a detector circuit, an STC/GAIN control circuit, a motor control circuit and a bearing pulse oscillator circuit.

2-3-1 STC/GAIN CONTROL CIRCUIT

The STC/GAIN circuit controls the sensitivity of the receiver in response to the setting of the STC GAIN control on the front panel.

When a trigger signal from a display unit is applied to a monomultivibrator (IC9), this circuit generates an STC gate signal which is determined by C62 and R62. The starting point of the STC gate signal is determined by C60 and R61.

The STC gate signal is buffer amplified at Q7 and is applied to an STC curve generator circuit (R67 ~ R69, C66, C67). STC mixes the GAIN control signal from the display unit with D5 and D7 which are buffer amplified at Q8 and applied to the second and third stages of the IF amplifiers.

2-3-2 IF AMPLIFIER AND DETECTOR CIRCUITS

The IF amplifier circuit consists of three stages. The first stage is a low-noise FET amplifier and second and third stages are monolithic amplifiers (IC1, IC2). All of these circuits are controlled by the STC/GAIN control signal.

An amplified IF frequency is detected at IC3, is amplified at Q3 ~ Q5, and is applied to the display unit.

2-3-3 MOTOR CONTROL CIRCUIT

The scanner motor is controlled by IC8 and Q9. An FG signal from the CTRL unit is applied to IC7 and IC8. The motor control circuit stabilizes the motor rotation in case of a load alteration, a voltage change in the power supply.

R53 adjusts antenna rotation, and MTSW is a motor stopper switch for maintaining the scanner unit.

2-3-4 BEARING PULSE GENERATOR CIRCUIT

The FG signal from the CTRL unit is shaped the waveform at IC7 and multiplied 8 times at IC5 and IC6. The bearing pulse oscillator generates a bearing synchronized pulse every 3600 pulses for each rotation.

IC7A is a motor stop sensor. When the motor stops, it resets IC5 and then stops the bearing pulse.

2-4 RF UNIT

The RF unit consists of a magnetron, a circulator, and a diode limiter.

The magnetron generates high energy oscillation (9410 MHz) for the input pulse. A ferrite circulator is used for the duplexer. The diode limiter is used to protect the receiving section at the front end.

The front end section consists of a local oscillator, an amplifier and a diode mixer. A microwave signal from the scanner unit is applied to a diode mixer section. The diode mixer circuit produces a 60 MHz IF signal which is mixed with a microwave signal and a local oscillation signal. The oscillation signal from the diode mixer adjusts the oscillating signal using the TUNE control.

2-5 MAIN UNIT

• MAIN CPU (IC17)

IC17 controls the I/O port (IC18), GDC (IC19) and IC50. IC17 also controls the processing of input data from LORAN-C (NMEA 0182, 0183), the data setting for the alarm area, and the operation of the data transmitter for the SUB CPU. IC17 (RXAO terminal) receives input data from LORAN.

• IC14, IC32B, IC44A, IC15C

These IC's decode the address data from IC17 for IC20 (RAM), IC21 (ROM) and IC18 (I/O).

The memory map is as follows;

0000	8000	A000	C000	E000	FFFF
ROM	RAM		GDC	I/O	

• IC43

IC43 oscillates the clock signal (12.288 MHz) for the MAIN CPU and SUB CPU.

• IC33, IC44F

IC33 and IC44F oscillate the RESET signal when the power is turned ON.

• IC29, IC30

IC29 counts compass data (N + 1 format). IC30 detects finished compass data and compass data being received. When a 2Q terminal is "L" level, IC17 is receiving compass data.

• IC19

IC19 produces graphic data (characters, straight lines on the CRT display, and rings) and generates a synchronized signal for CRT control. MR-40 employs normal monochrome display. To improve resolution, the CRT uses an interlace mode.

• IC10

IC10 is a DRAM which memorizes text screen data on the CRT display using a control signal, an address signal, and a data signal from IC19.

• IC4, IC5D, IC6A, IC8, IC9, IC12A, IC15A/B, IC13, IC16, IC31

These IC's produce a control signal of DRAM (RAS, CAS, /WR) using IC19 (GDC).

• IC45, IC22

IC45 and IC22 oscillate 24 MHz to produce a clock signal for IC19 (3 MHz) and a dot clock signal for the CRT (12 MHz).

• IC27

IC27 converts parallel video data from IC10 to serial data.

• IC6B/C/D

These IC's clear a memory when the screen is a stand-by screen or the range changes.

• IC2, IC3

IC2 and IC3 convert the parallel data to serial data on PPI memory.

• IC40, IC41, IC12C/D

These IC's cut the bottom of the PPI screen to show the text screen clearly.

• IC16D, IC7

IC16D and IC7 turn over the screen to show a heading marker, EBL and VRM clearly when the PPI and text screen are piled up.

• IC5

IC5 combines the text and PPI screen.

• Q1, Q7

Q1 and Q7 act as a buffer for changing the signal's pulse width. When the range is short range (0.25 ~ 1 NM), these transistors send HI signals to the scanner unit.

• RL1

RL1 is an external control relay. The relay turns ON when a target moves into an alarm zone. Q3 is a driving transistor for RL1.

• RL2

RL2 is an FTC control relay. A radar echo signal is applied to IC46 directly when the FTC is turned ON. The radar echo signal is applied to IC46 through to C18 when the FTC is turned OFF.

• IC46

IC46 converts the radar echo signal to a digital signal. If the radar echo signal is greater than the threshold voltage, this digital signal is applied to the LOGIC UNIT. Q11 is a deriving transistor for RL2. When the radar echo signal is less than the threshold voltage, it is applied to IC34 through Q10 and R29. Then, this signal converts a TUNE signal. Finally, the radar echo signal is applied to IC18.

• IC50

IC 50 is an EPROM which can clear or write electrically. This IC memorizes LORAN data format and bow correction data. Even if the power switch is turned OFF memory still remains in IC50. This IC is controlled by the CKS, RXS, TXS and /RSTO terminals on the CPU.

2-6 LOGIC UNIT

• IC1, IC2, IC34, IC29, IC31

The scanner unit applies one ship marker and 3600 pulses for each complete rotation to the LOGIC unit. IC1, IC2, IC34, IC29B and IC31 generate 3600 trigger pulses (0.25 ~ 1 NM) or 1800 trigger pulses (2 NM or more). When the scanner is malfunctioning, IC1, IC34E and IC25A force the MAIN UNIT to stop the transmit trigger pulse.

• IC3

IC3 processes bearing data, Rθ/XY convert data, alarm zone setting data, north-up data and centershift data for PPI screen using the ship marker and bearing signal.

• IC6, IC7, IC4, IC5, IC25

IC6 and IC7 select either reading the echo signal or writing on the PPI screen.

• IC22, IC23

IC22 and IC23 produce a clock signal for PPI writing controlled by IC27, IC28 and IC33.

• IC78C

IC78C is a 3 input NAND gate IC. When the HOLD switch is turned ON, IC78C stops the memory writing signal for DRAM. Then the PPI screen is frizzed.

• IC20, IC21, IC24, IC35, IC36

IC20, IC21, IC24, IC35 and IC36 cut off a GDC address control when the PPI screen data writes to the DRAM on the MAIN unit.

• IC42 ~ IC46, IC57, IC77

A digital echo signal from the MAIN unit is applied to the sampling circuit consisting of IC44, IC45, IC46 through to the digital filter consisting of IC42, IC43 and IC57 to suppress noise. A sampling clock circuit selects the proper sampling pulse through the range data signal.

• IC65, IC47, IC48, IC56C

IC65, IC47, IC48 and IC56C produce a sampling clock pulse.

An alarm range counter A consists of IC64 and IC69 which count latch data using IC63. An alarm range counter B consists of IC70 and IC71 which count latch data using IC62. Both range data are combined at IC30B and IC61A.

• IC30, IC61 ~ IC64, IC69 ~ IC73, IC76, IC78

IC78B and IC61B judge the alarm setting bearing and alarm function. IC72 and IC76C judge whether a target is in the alarm zone or not using the range and bearing setting data. The signal of IC61B is also used as an alarm zone display signal.

• IC53 ~ IC55, IC66, IC67, IC73, IC74, IC77

An echo signal which is in the buffer memory (IC77) is applied to the IR circuit (IC66). The echo data which counts transmit every 8 minutes are applied to IC53, IC74, IC66, IC54 and IC55 to distinguish 3 levels of brightness. This echo data is applied to PPI memory through the target expansion circuit which consists of IC67, IC73D and IC74A.

• IC59, IC60

IC59 and IC60 are counters which measure how many echo signals are read or written in the buffer memory. This counter is written in the buffer memory until the counter counts 320 dots.

• IC51

IC51 changes a clock signal when the echo signal is read or written to the buffer memory.

RANGE	READ		WRITE	
	AC = HI	IC53 control	AC = LOW	
0.25	CKS5	CKS5	16.1875 MHz	(1/1)
0.5	CKS4	CKS3	16.1875 MHz	(1/1)
1.0	CKS4	CKS3	8.093748 MHz	(1/2)
2.0	CKS4	CKS3	4.046874 MHz	(1/4)
4.0	CKS4	CKS3	2.023437 MHz	(1/8)
8.0	CKS4	CKS3	1.011718 MHz	(1/16)
16	CKS4	CKS3	0.505859 MHz	(1/32)
24	CKS4	CKS3	0.337239 MHz	(1/48)

2-7 MAIN-A UNIT

The MAIN A unit consists of DRAM and shift resistors to avoid missing dots on the screen when the screen is shifted or when the long range PPI screen is used.

IC2 ~ IC5 : SUB DRAM for PPI

IC6, IC7 : Shift resistor for SUB DRAM

IC1 : Buffer for data changing

RANGE (RING)		OUTPUT PORT					SAMPLING CLOCK	
RANGE	RING	SSL	DPL	RS1	RD-A			
0.25	0.125	0	0	0	1111	16.1875 MHz	(1/1)	
0.5	0.25	1	0	0	1111	16.1875 MHz	(1/1)	
1.0	0.25	1	0	1	1111	8.093748 MHz	(1/2)	
2.0	0.5	1	1	0	1110	4.016874 MHz	(1/4)	
4.0	1.0	1	1	0	1100	2.023437 MHz	(1/8)	
8.0	2.0	1	1	1	1110	1.011718 MHz	(1/16)	
16	4.0	1	1	1	1100	0.505859 MHz	(1/32)	
24	6.0	1	1	1	1010	0.337239 MHz	(1/48)	

0 : LOW 1 : HIGH

2-8 REAR UNIT

The power supply circuit is designed to provide various types of power output for the whole radar from the nominal ship's mains of 12V, 24V or 32V DC. The power supply circuit consists of a switching regulator, a DC-DC converter, and line filter circuits.

2-8-1 INPUT CIRCUIT

11 ~ 40 V DC power is applied to the REGULATOR UNIT through J5. L1 is a line filter and filters radio frequency signals to prevent them from being applied to the switching circuit.

2-8-2 SWITCH CIRCUIT

IC3 is an IC chip for controlling the switching regulator. At first, when DC power is applied to J5, a pulse is applied to IC2 (pin 4) through C10 and IC2 is reset.

When the power switch is pushed once, IC1 (pin 6) and IC2 (pin 11) are "HIGH," then Q4 is turned ON and DC power is applied to IC3 (pin 12). When the power switch is pushed and held again for longer than 1 second, DC power is charged into C9 through R5. IC1 (pin 9) is "HIGH" 1 second after the power switch is pushed. Therefore, IC2 (pin 1) is "LOW." Then, Q4 is turned OFF.

Q2, Q3 and Q5 control constantly to keep the DC power voltage for 13 V DC or less from being applied to IC3 (pin 12).

2-8-3 SWITCHING CONTROL CIRCUIT

IC3 includes a switching control and oscillator circuit in the package. The oscillator frequency is 50 kHz which is determined by R26 and C22, and oscillates saw tooth waves.

When the power switch is turned ON, DC power is applied to IC3 (pin 3) through D14. After the power switch is turned ON, support voltage exceeds input voltage. Even if the input voltage decreases, output voltage remains stable.

R34 ~ R36 divide the 12 V. Compared voltage at D16 and IC5 is applied to IC3 through photo-coupler (IC4).

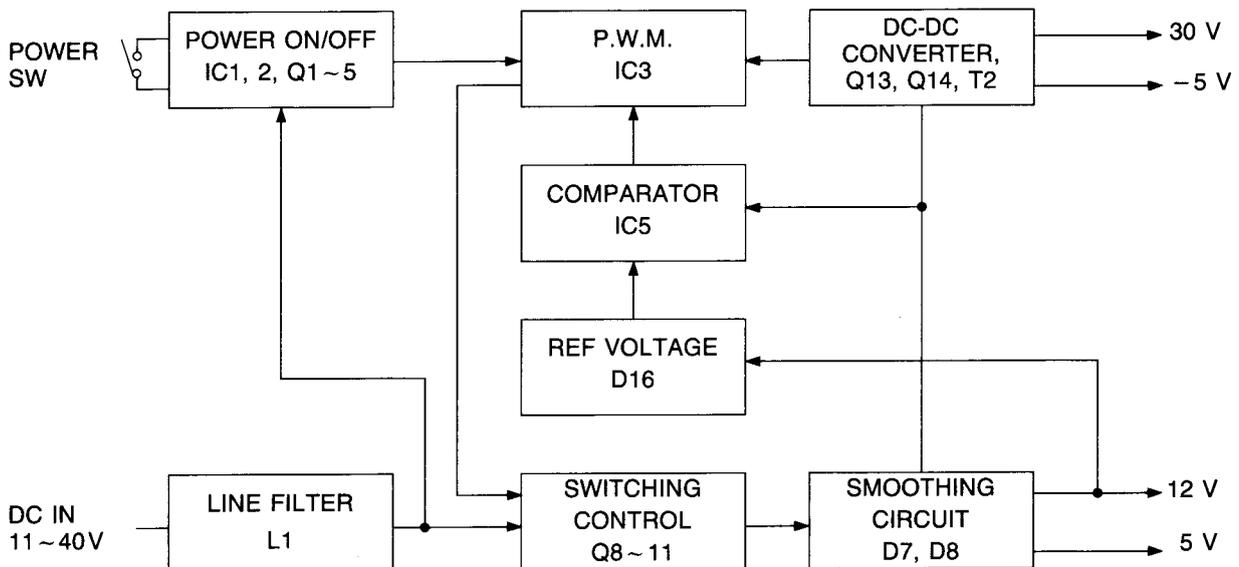
2-8-4 OUTPUT VOLTAGE CONTROL CIRCUIT

A pulse width signal from the control circuit is applied to the switching device (Q8 ~ Q11).

Output power from the secondary winding of T1 is rectified by D7 and D8. Output is applied to the smoothing circuit L12, C15 ~ C18).

2-8-5 SUPPORT VOLTAGE CIRCUIT

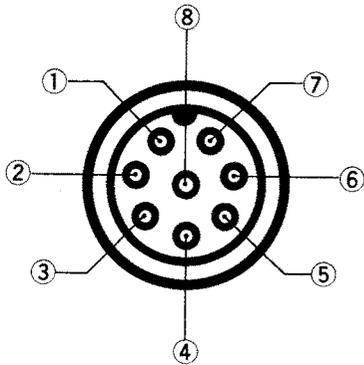
The support voltage circuit consists of a self-excitation type DC-DC converter. This circuit produces +30 V, -5 V and gate voltage for control circuit.



SECTION 3 CONNECTOR INFORMATION

3-1 COMPASS SOCKET

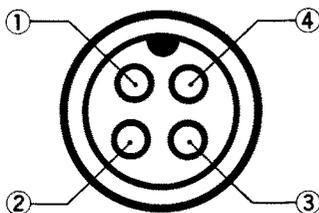
This socket accepts the connection of a compass interface.
For example; N + 1 data interface



① N + 1 data input [COMPASS]	⑤ No connection
② DC 12 V output [+ 12V]	⑥ No connection [+ 5V]
③ No connection	⑦ No connection [GND]
④ Ground [GND]	⑧ No connection

3-2 DC POWER SOCKET AND ALARM TERMINAL

This socket accepts the connection of 11 ~ 40 V DC and external buzzer etc.

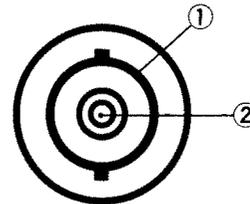


① DC voltage input [SHIP'S (+)]
② External alarm [EXT ALM 1]
③ External alarm [EXT ALM 2]
④ Ground [SHIP'S GND]

3-3 NMEA IN SOCKET

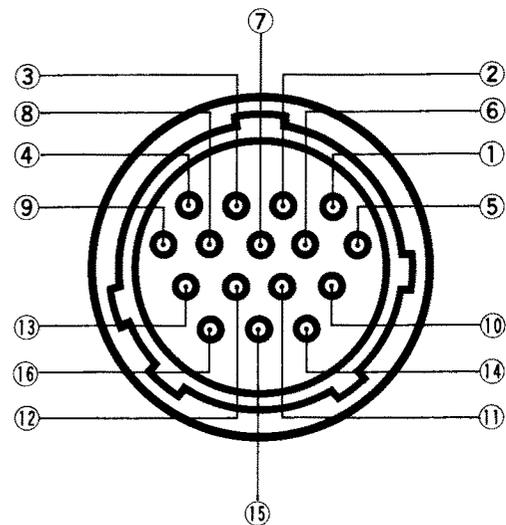
This socket accepts the connection of a navigation receiver with NMEA 182 or 183 data format such as Loran-C or GPS.

① Data input [LORAN]
② Ground [LOGND]



3-4 SCANNER SOCKET

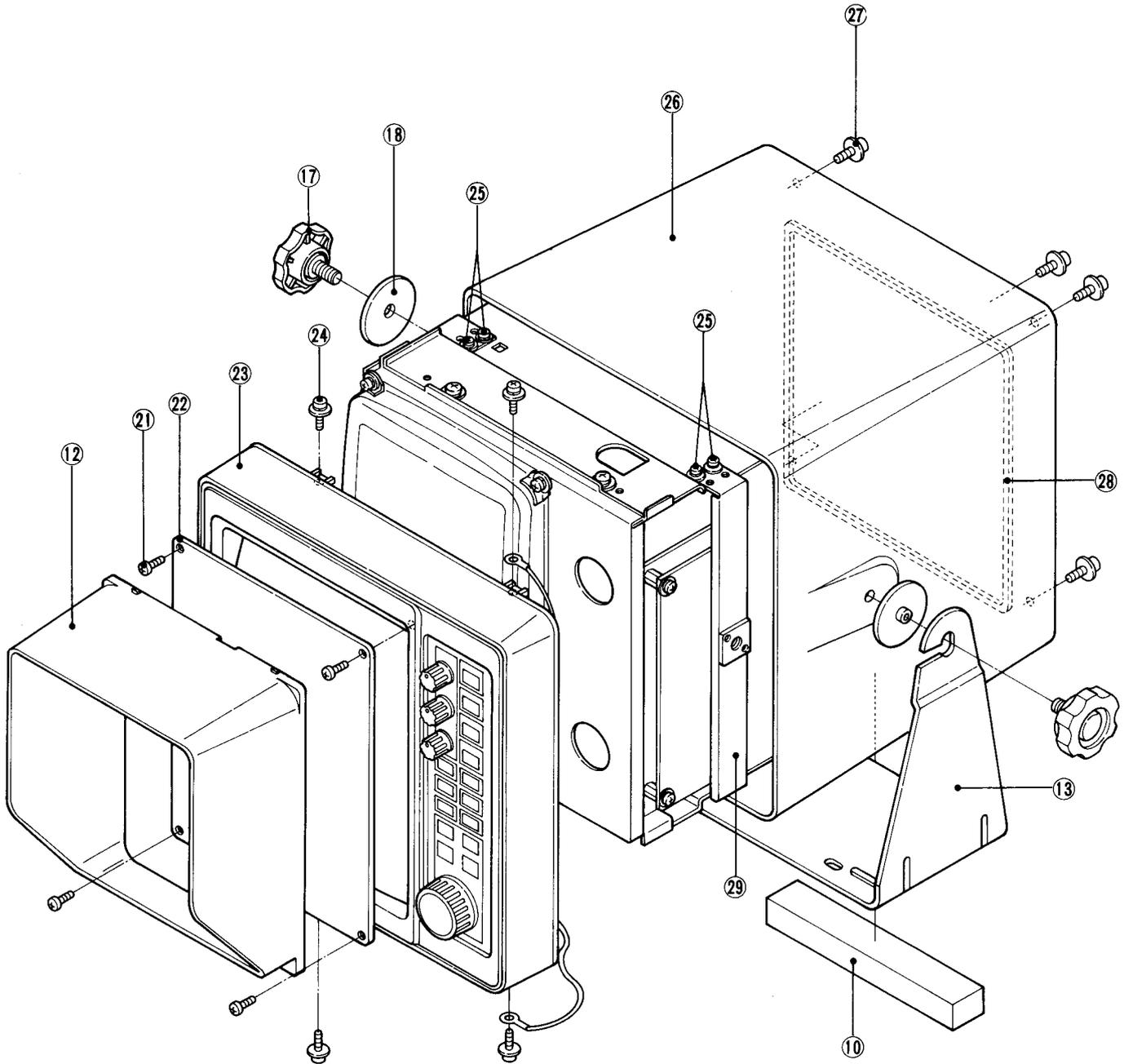
This socket accepts the connection of SCANNER UNIT.



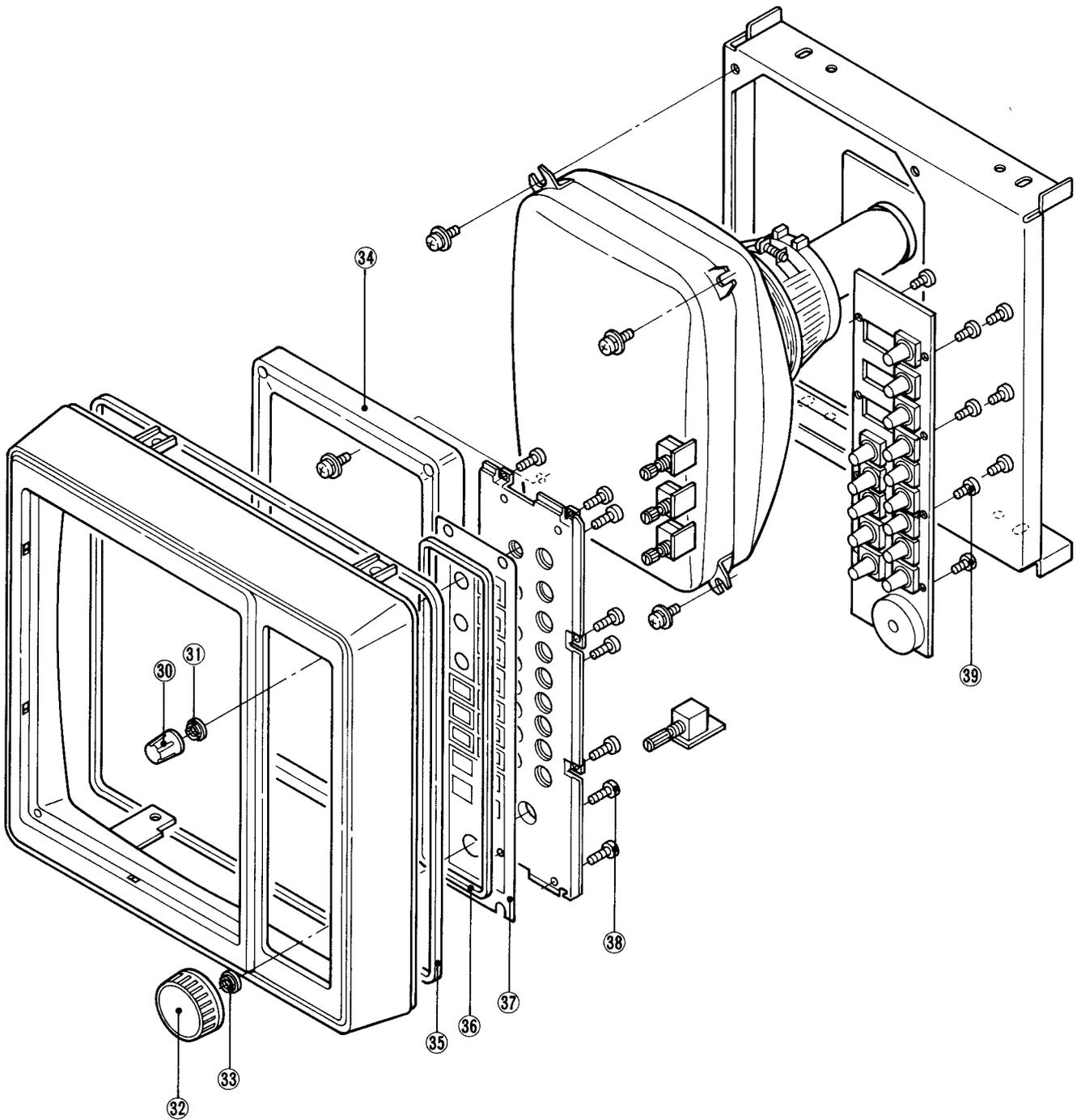
① Bearing pulse input [B.PULSE]	⑨ Tune output [TUNEOUT]
② Pulse length output [P.L.]	⑩ DC voltage output [+ 12V]
③ Video ground [VIDEO GND]	⑪ DC voltage output [+ 12V]
④ Raw video input [RAWVIDEO]	⑫ Ground [GND]
⑤ Trigger output [TRIG]	⑬ Ground [GND]
⑥ Ship marker input [SHM]	⑭ Via SCANNER MT switch to GND
⑦ STC output [STCOUT]	⑮ No connection
⑧ GAIN output [GAINOUT]	⑯ No connection

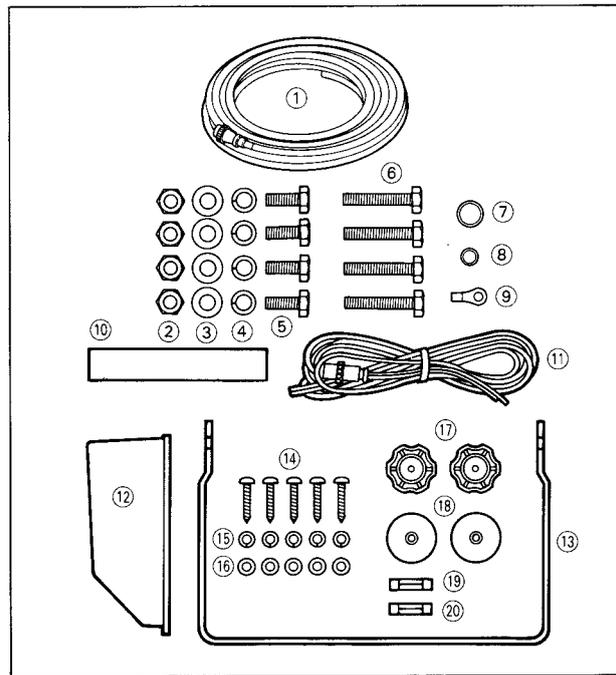
SECTION 4 MECHANICAL PARTS AND DISASSEMBLY

4-1 DISASSEMBLY FOR COVER AND CASE (DISPLAY UNIT)



4-2 DISASSEMBLY FOR SWITCH AND VOLUME (DISPLAY UNIT)





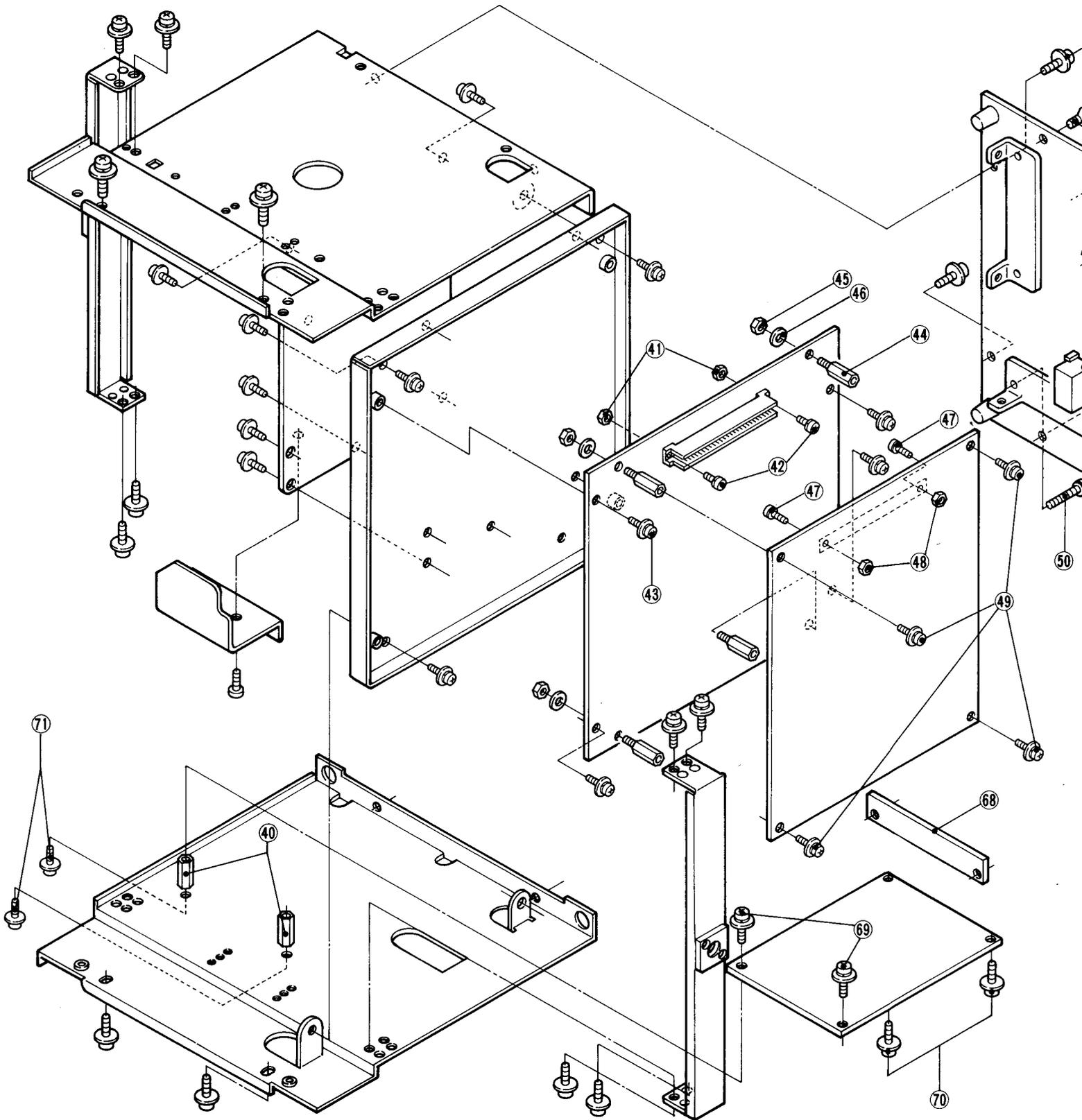
• SUPPLIED ACCESSORIES

LABEL NUMBER	ORDER NUMBER	DESCRIPTION	QTY.
①	Option	OPC-279 system cable	1
②	8830000270	Nut M 10 SUS	4
③	8850001150	Flat washer M 10 SUS	4
④	8850001140	Spring washer M 10 SUS	4
⑤	8810006420	Hexagon bolt M 10 x 25 SUS	4
⑥	8810006380	Hexagon bolt M 10 x 50 SUS	4
⑦	8930010000	Connector cover	1
⑧	8930019500	BNC-R connector cover	1
⑨	6450001030	SRCN6A25-16P	1
⑩	8930019690	Sponge (CK)	1
⑪	Option	OPC-275 DC power cable	1
⑫	8010010600	749 hood	1
⑬	8010010390	Bracket	1
⑭	8810001500	Screw PH M 6 x 30 SUS	5
⑮	8850000510	Spring washer M 6 SUS	5
⑯	8850000190	Flat washer M 6 (6x13x1.0)SUS	5
⑰	8820000610	Mounting screw knob G2-6-20	2
⑱	8930015280	Bracket rubber	1
⑲	5210000070	FGB 10A	1
⑳	5210000060	FGB 5A	1

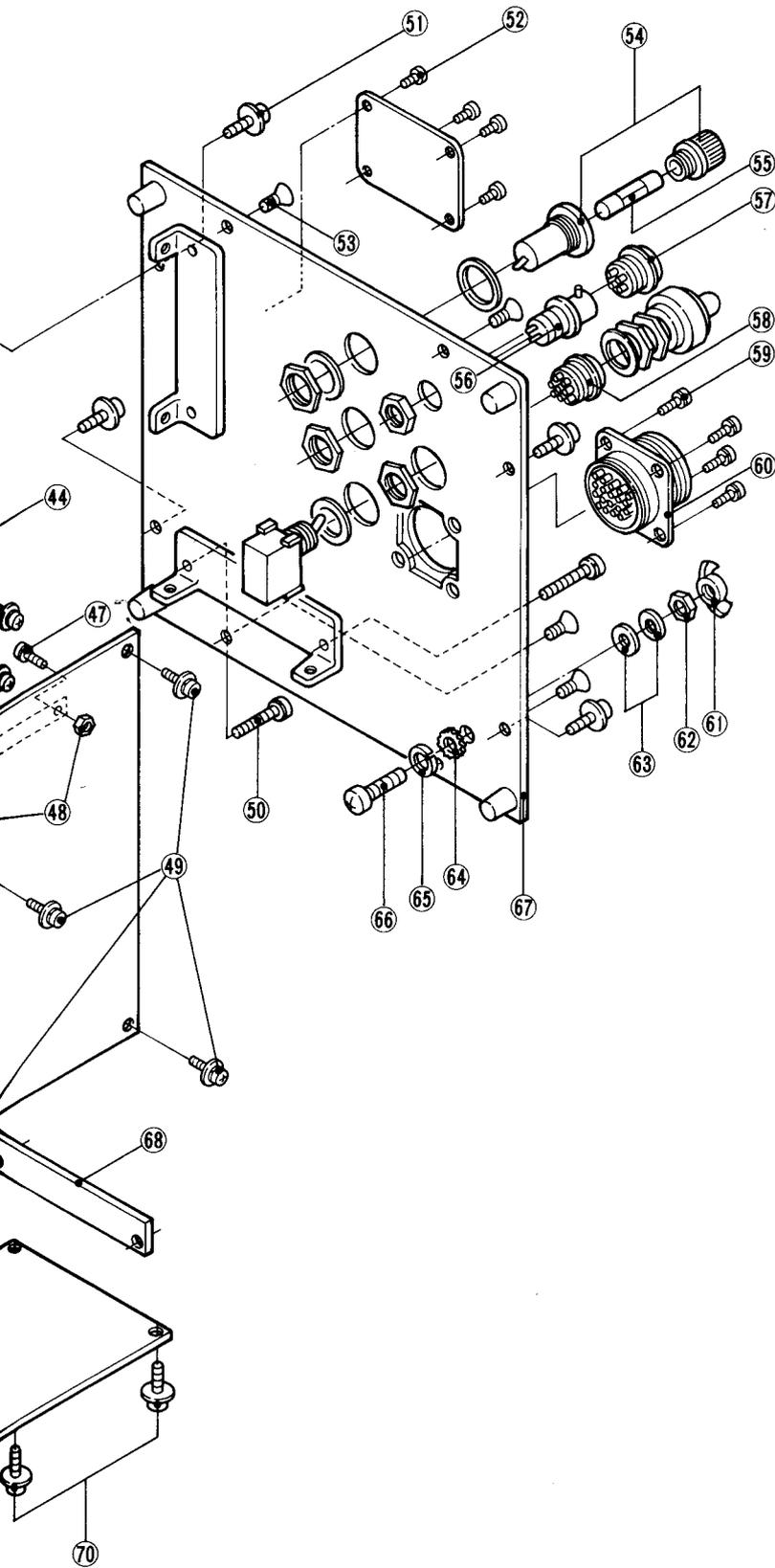
SCREW ABBREVIATIONS

PH : Pan head FH : Flat head B0 : Self-tapping screw
 SUS : Stainless NI : Nickel BS : Brass

4-3 DISASSEMBLY FOR INSIDE PARTS (DISPLAY UNIT)



• DISPLAY UNIT

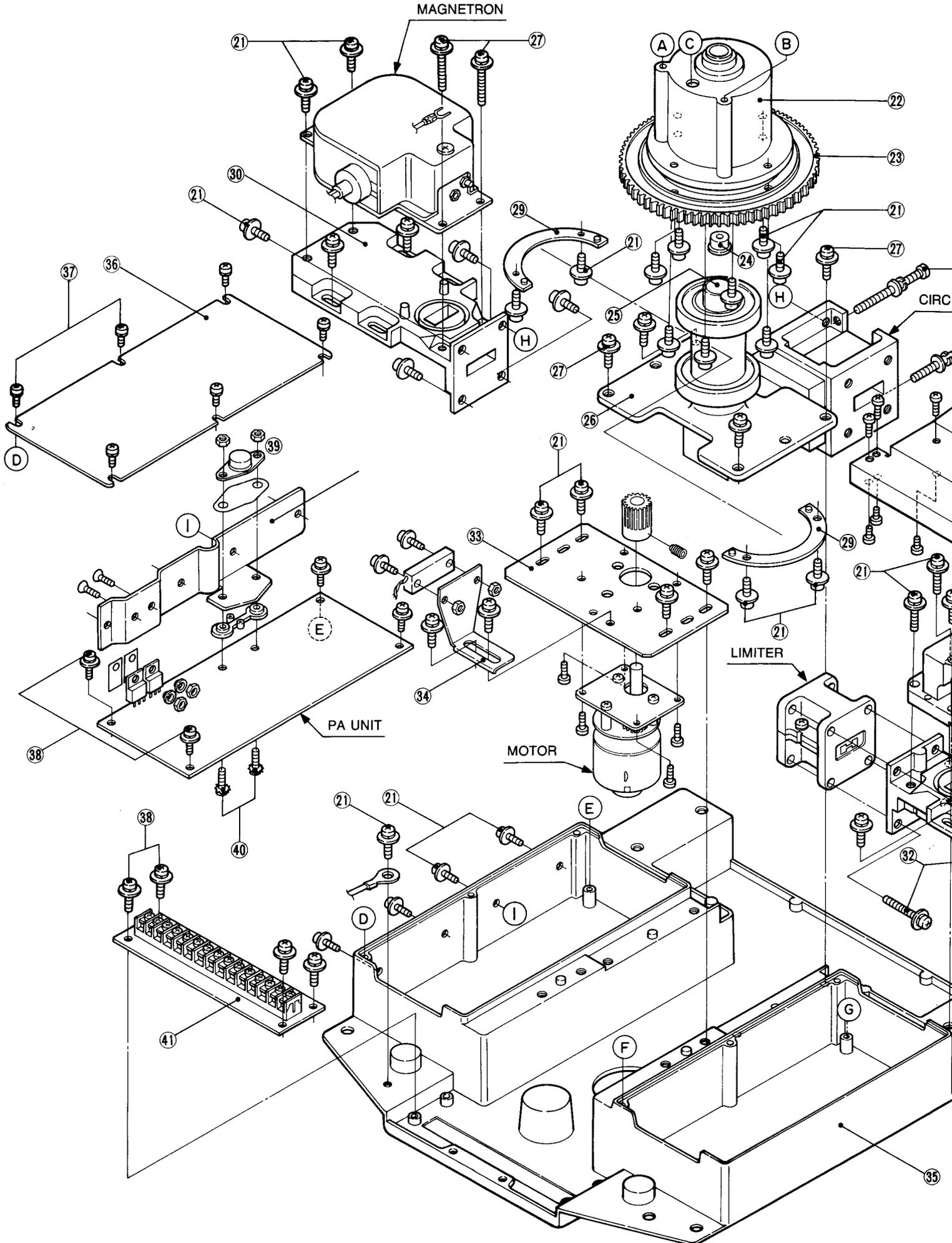


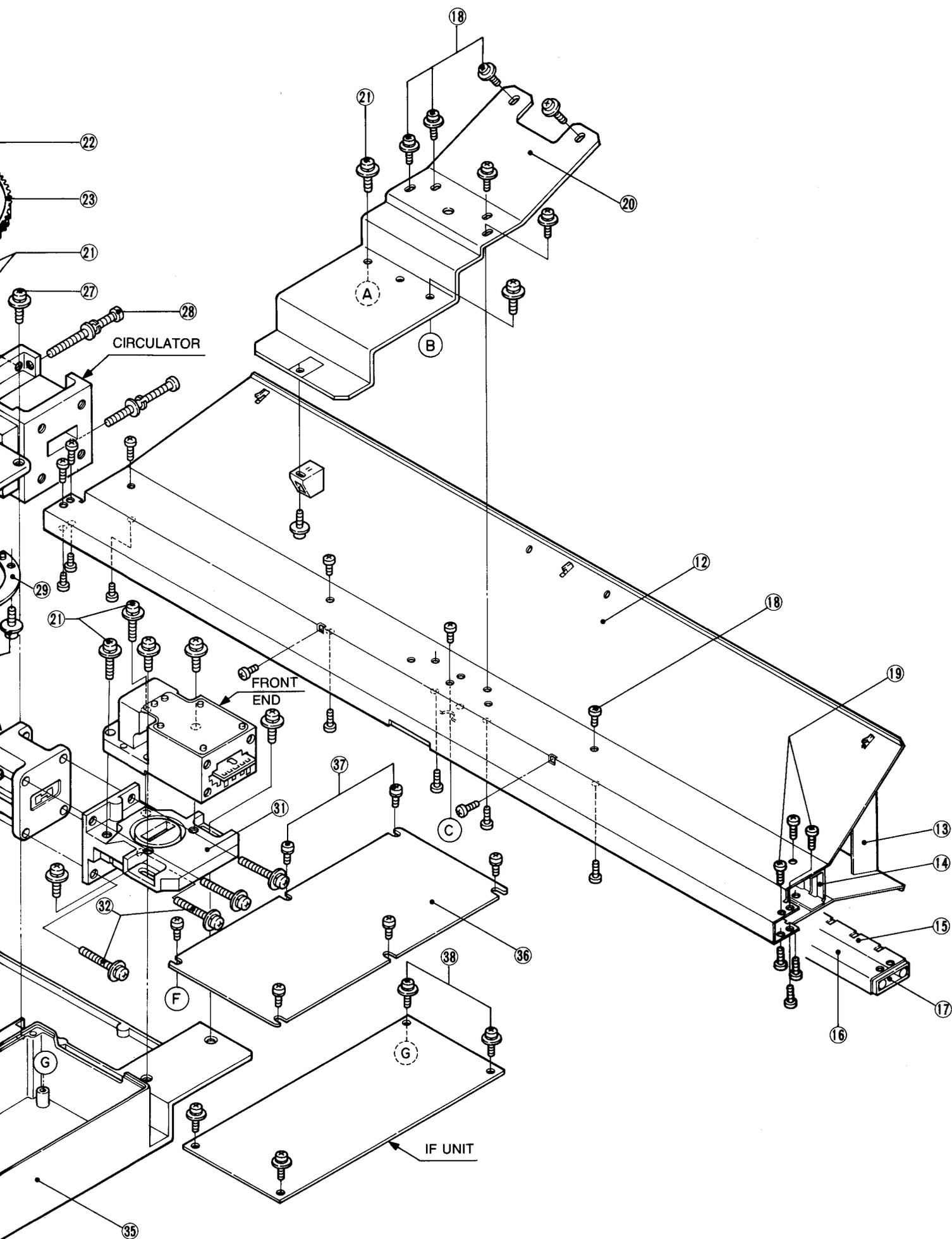
LABEL NUMBER	ORDER NUMBER	DESCRIPTION	QTY.
21	8810006020	Screw PH B0	4
22	8310020620	749 Screen	1
23	8210005980	Front panel C-04114	4
24	8810003390	Setscrew C M 4 x 8	4
25	8810003360	Setscrew C M 3 x 6	8
26	8010010610	749 Case	1
27	8810006320	Setscrew C M 4 x 10 SUS	4
28	8930019200	Back panel rubber	1
29	8010010340	749 Bracket holder	2
30	8610006770	Knob N-141 (B)	3
31	8830000550	VR nut (E)	3
32	8610006810	Knob N-63 (B)	1
33	8830000550	VR nut (E)	1
34	8930019460	749 CRT rubber	1
35	8930019210	Front seal rubber	1
36	8930019240	Key board seal rubber	1
37	8010010550	749 Switch board	1
38	8810001050	Screw PH B0 M 2.6 x 8	8
39	8810001040	Screw PH B0 M 2.6 x 6	8
40	8930000520	Thread spacer (B)	2
41	8830000180	Nut M 2.6 NI BS	2
42	8810003140	Setscrew A M 2.6 x 8	2
43	8810003360	Setscrew C M 3 x 6	4
44	8930000270	Standoff (W)	4
45	8830000190	Nut M 3 NI BS	4
46	8850000420	Spring washer M 3 NI	4
47	8810003140	Setscrew A M 2.6 x 8	2
48	8830000180	Nut M 2.6 NI BS	2
49	8810003360	Setscrew C M 3 x 6	4
50	8810006350	Setscrew A M 3 x 20 SUS	2
51	8810006260	Screw PH M 3 x 5 SUS	4
52	8810006260	Screw PH M 3 x 5 SUS	4
53	8810002510	Screw FH M 3 x 6 SUS	4
54	5220000140	FH-042	1
55	5210000070	FGB 10A	1
56	6510011420	31-10	1
57	6510007560	FM14-4S	1
58	6510012160	FM214-8S	1
59	8810003170	Screw A M 3 x 8	4
60	8900002900	749 system connector	1
61	8830000370	Wing nut M 5 SUS	1
62	8830000250	Nut M 5 SUS	1
63	8850000180	Flat washer M 5 SUS	2
64	8850000600	Star washer M 5 SUS	1
65	8850000500	Spring washer M 5 SUS	1
66	8810000700	Screw PH M 5 x 20 SUS	1
67	8010010180	749 back panel	1
68	8930019390	FET plate	1
69	8810003360	Setscrew C M 3 x 6	2
70	8810003360	Setscrew C M 3 x 6	2
71	8810003360	Setscrew C M 3 x 6	2

SCREW ABBREVIATIONS

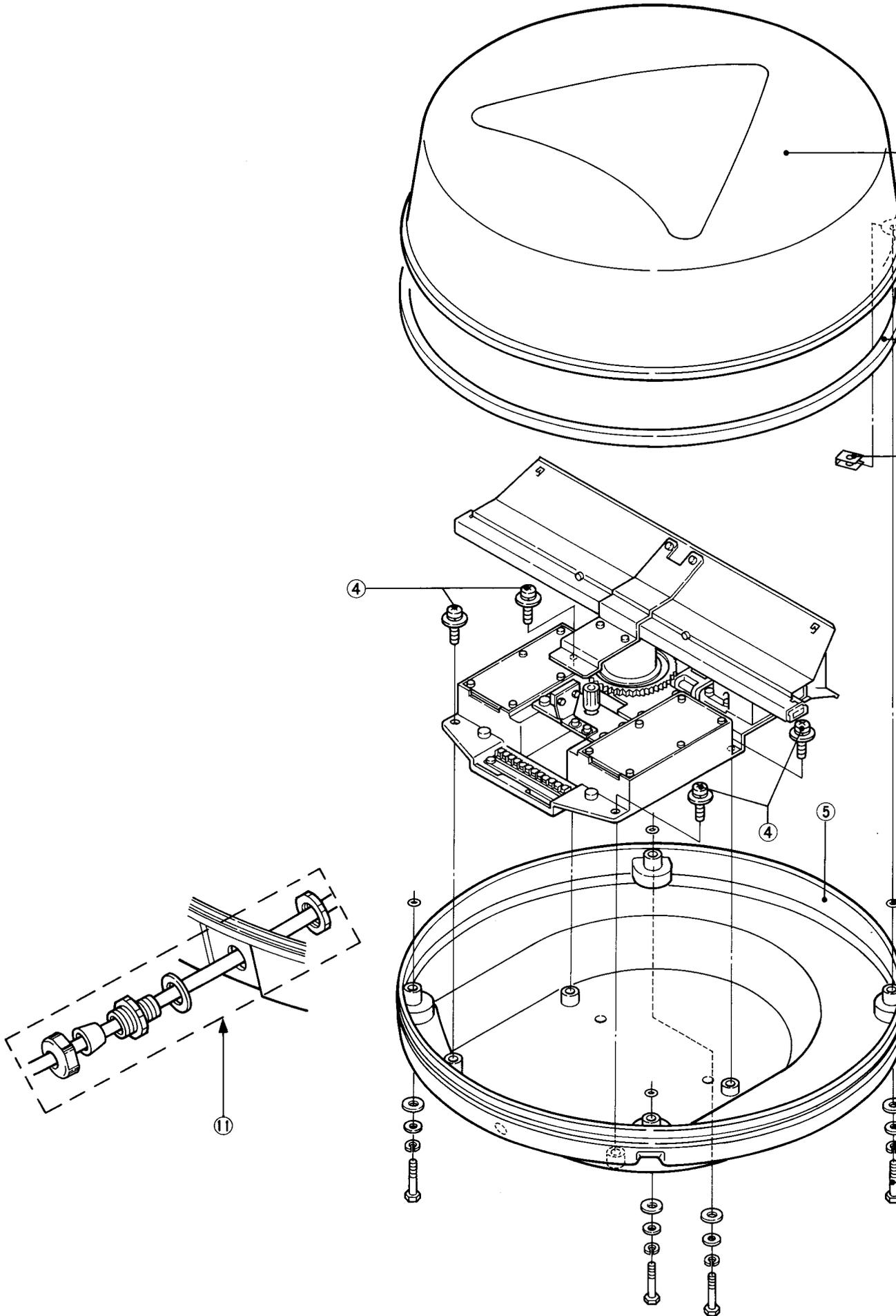
PH : Pan head FH : Flat head B0 : Self-tapping screw
 SUS : Stainless NI : Nickel BS : Brass

4-4 DISASSEMBLY FOR INSIDE PARTS (SCANNER UNIT)

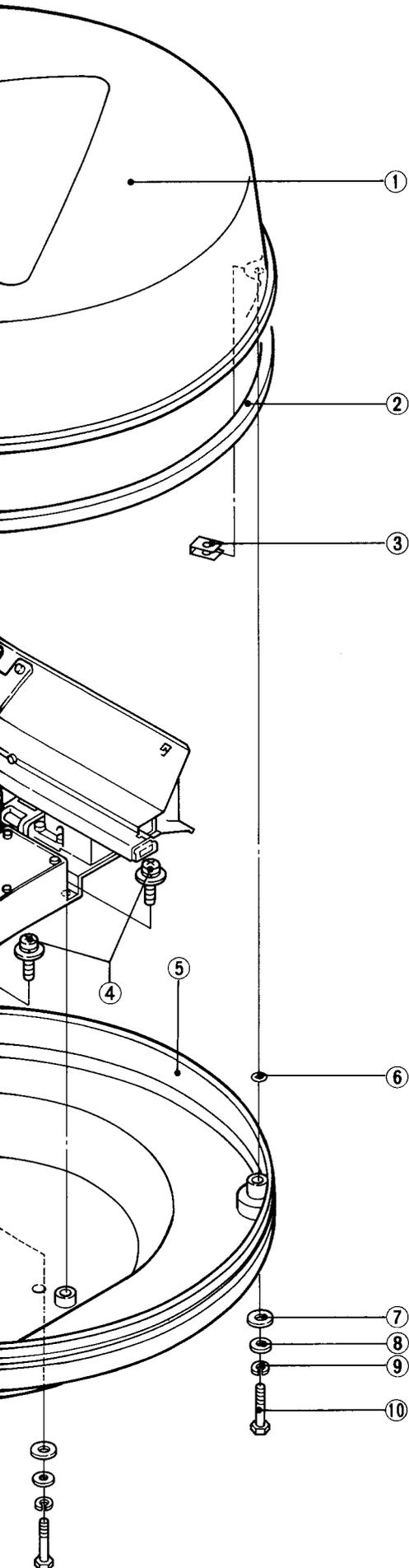




4-5 DISASSEMBLY FOR COVER (SCANNER UNIT)



• SCANNER UNIT

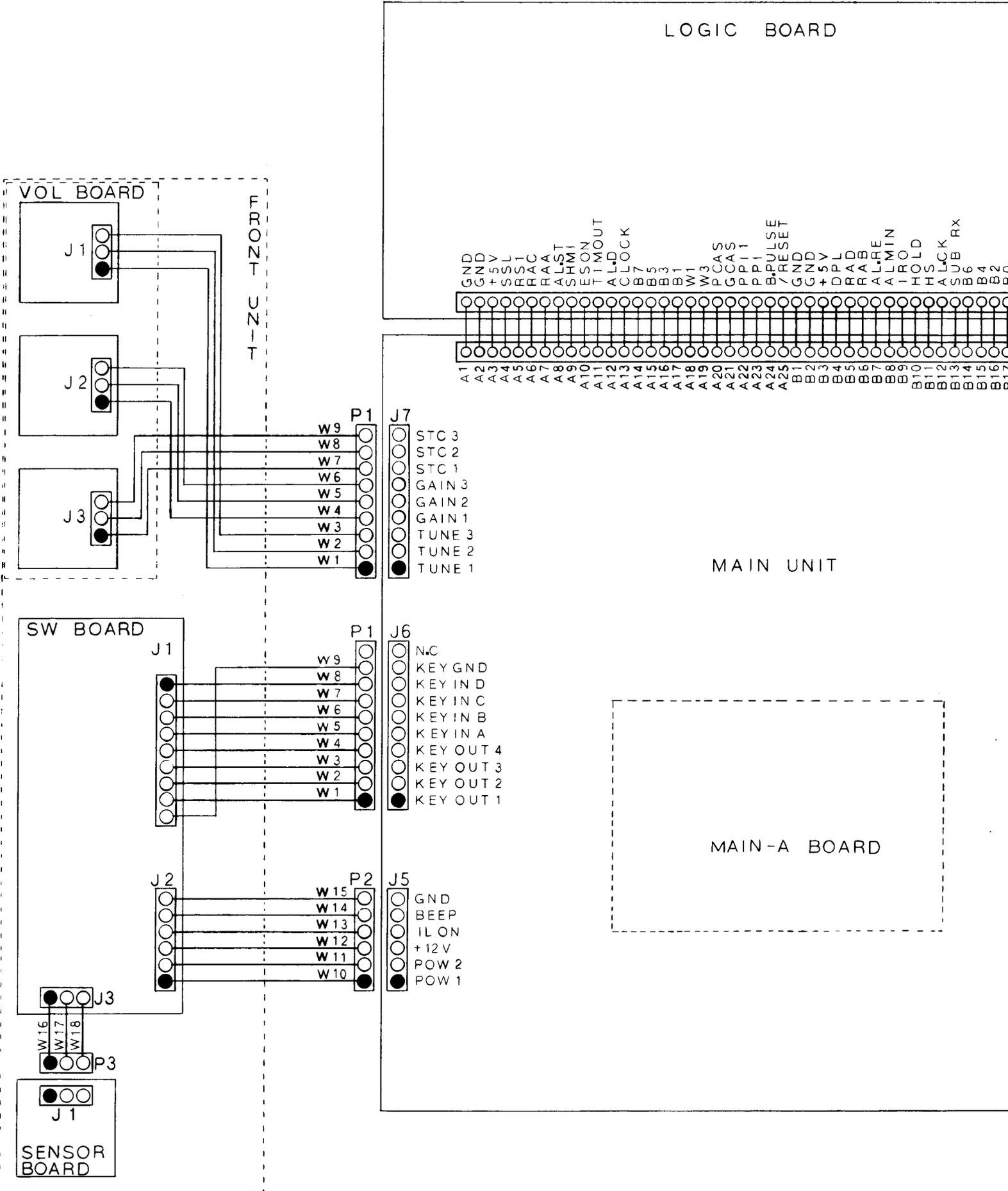


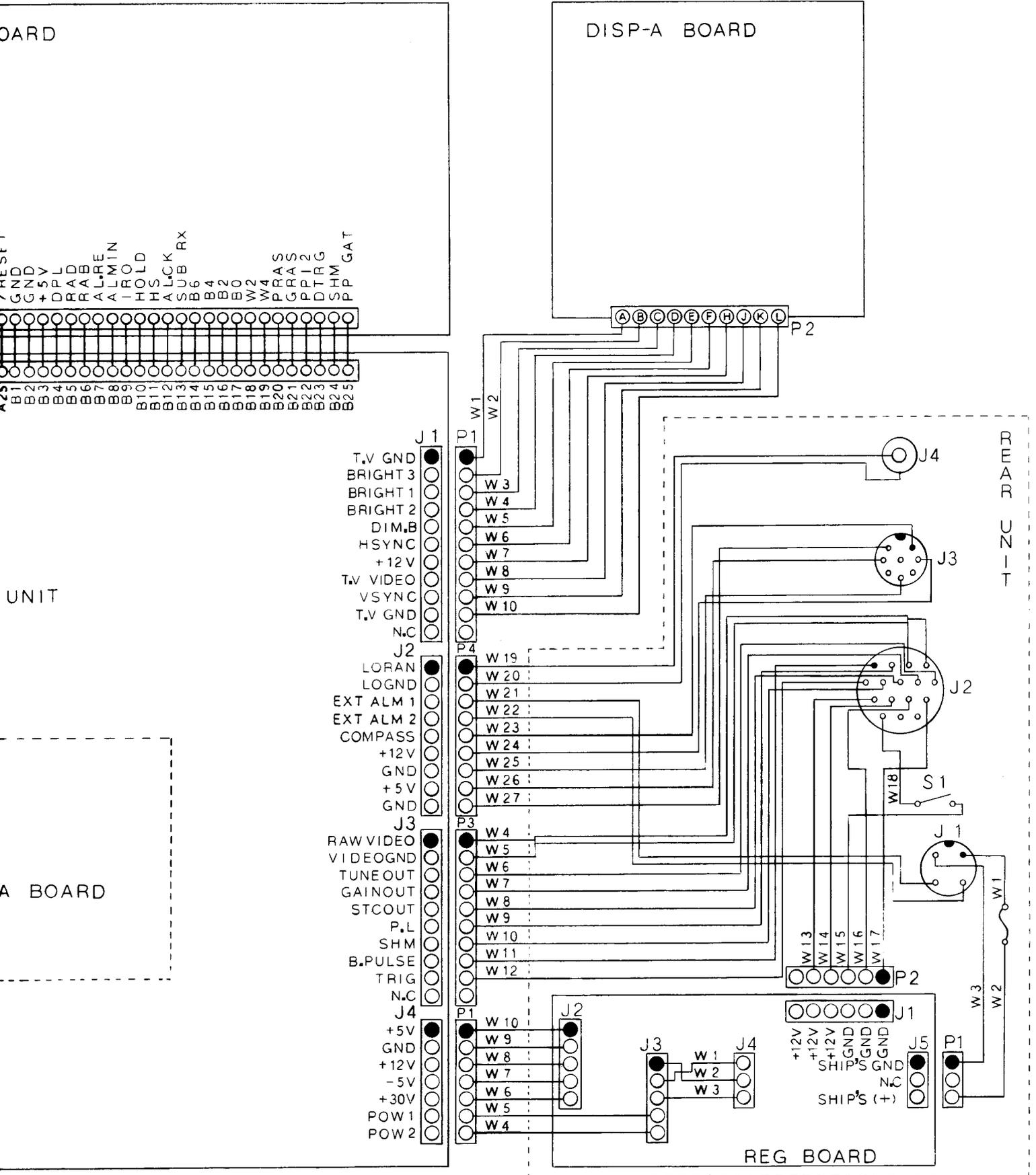
LABEL NUMBER	ORDER NUMBER	DESCRIPTION	QTY.
①	8010010650	Radome top cover	1
②	8930019070	Radome rubber seal	1
③	8930019560	Rack nut RAC-M5-C40	4
④	8810006440	Setscrew C M 5 X 12 SUS	4
⑤	8010010660	Radome bottom cover	1
⑥	9830019720	O ring SO-015-5	4
⑦	8930019230	Sealing washer (F)	4
⑧	8850000180	Flat washer M 5 SUS	4
⑨	8850000500	Spring washer M 5 SUS	4
⑩	8810006400	Radome mounting screw	4
⑪	6910005010	SCL-14B	1
⑫	8010010330	Reflector	1
⑬	8930019330	Reflector stay	3
⑭	8010010350	Grating filter	1
⑮	8010010320	F slot array	1
⑯	8010010310	R slot array	1
⑰	8010010210	Slot array short	2
⑱	8810006270	Screw PH B1 M 2.6 x 5 SUS	10
⑲	8810000570	Screw PH M 2.6 x 5 SUS	8
⑳	8510006780	Balancer	1
㉑	8810006320	Setscrew 4 x 10	2
㉒	8010010200	Sleeve	1
㉓	8010010520	Sleeve gear	1
㉔	8930019360	Insulator	1
㉕	8930019350	Center conductor	1
㉖	8010010220	Feeder waveguide	1
㉗	8810006310	Setscrew C M 4 x 16 SUS	4
㉘	8810006240	Screw PH M 4 x 65 SUS	2
㉙	8930019430	Sleeve stopper	2
㉚	8010010250	L-corner waveguide	1
㉛	8010010240	S-corner waveguide	1
㉜	8810006250	Screw PH M 4 x 45 SUS	4
㉝	8930019370	Motor bracket	1
㉞	8930019420	HM SW bracket	1
㉟	8010010150	Chassis	1
㊱	8510006790	Shield case cover	2
㊲	8810006330	Setscrew C M 3 x 6 SUS	8
㊳	8810006370	Setscrew A M 3 x 6 SUS	12
㊴	8410001550	749 heat sink	1
㊵	8810000260	Screw PH M 3 x 12	2
㊶	0100749089	Harness unit	1

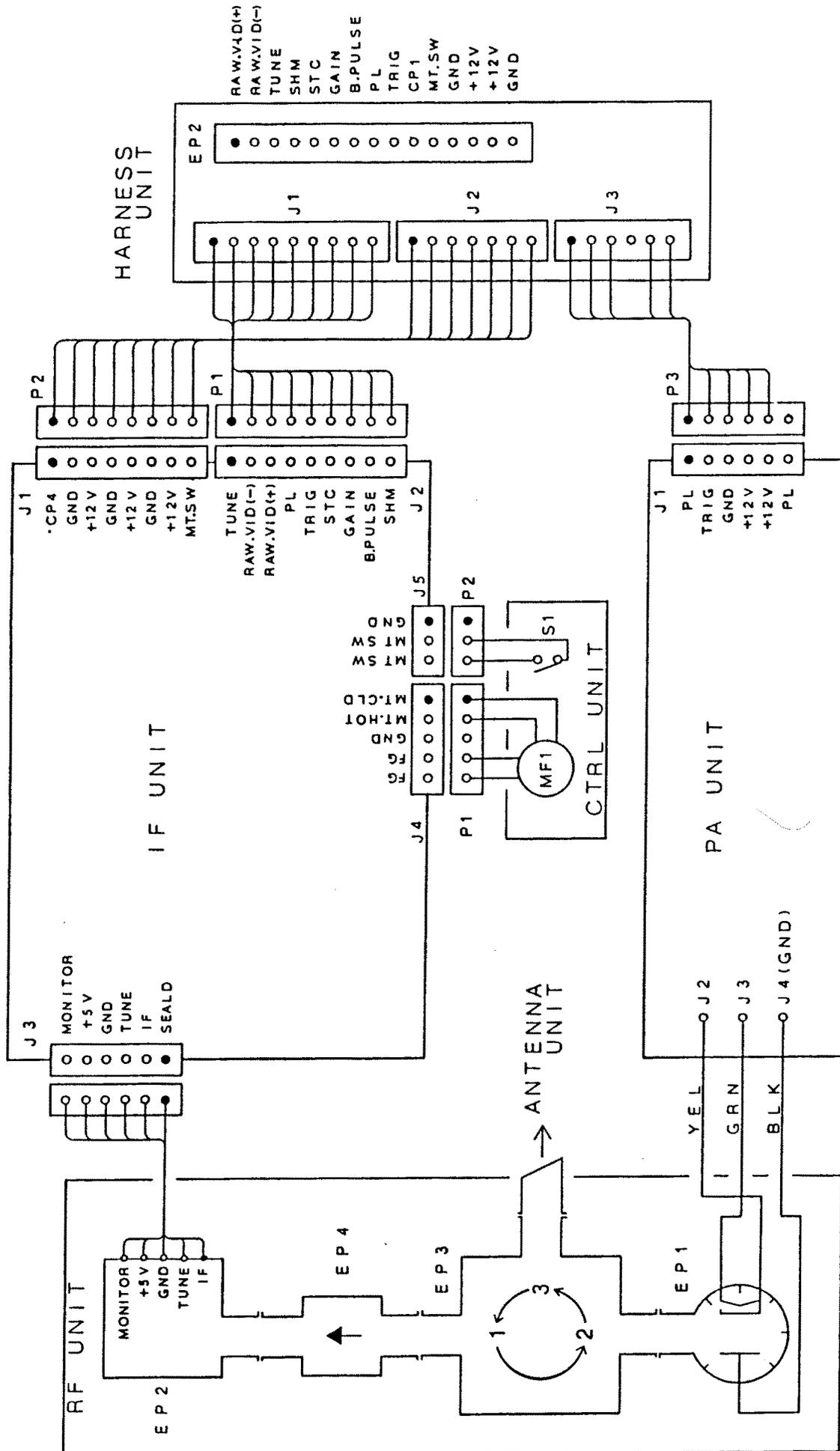
SCREW ABBREVIATIONS

PH : Pan head FH : Flat head B0 : Self-tapping screw
 SUS : Stainless NI : Nickel BS : Brass

SECTION 5 CONNECTOR ASSEMBLY







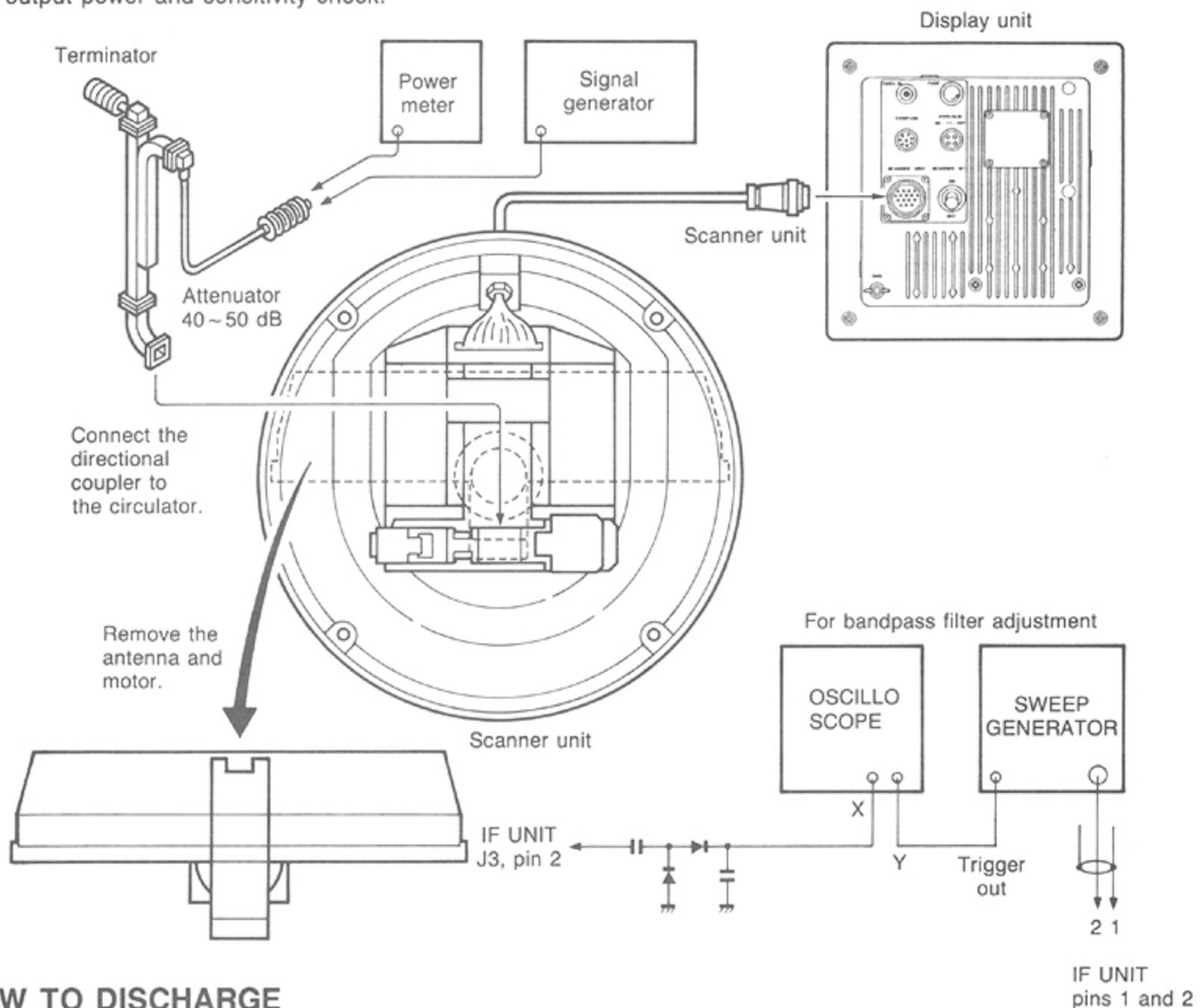
SECTION 6 ADJUSTMENT PROCEDURE

6-1 REQUIRED TEST EQUIPMENT

EQUIPMENT	GRADE AND RANGE	EQUIPMENT	GRADE AND RANGE
DC power supply	Output voltage : 11 ~ 40 V DC Current capacity : 5 A or more	Standard signal generator (used for sensitivity check only)	Frequency range : 1.0 ~ 10.0 GHz Output level : -127 ~ -17 dBm (0.1 μ V ~ 32 mV)
Sweep generator	Frequency range : 20 ~ 100 MHz Sweep bandwidth : At least 30 MHz Output impedance : 50 Ω	Attenuator	Power attenuation : 40 or 50 dB Peak power level : At least 6 kW Average power level : At least 5 W
Oscilloscope	Frequency range : DC ~ 20 MHz Measuring range : 0.01 ~ 10 V	Terminator	impedance : 50 Ω Peak power level : At least 6 kW Average power level : At least 5 W
AC milli-voltmeter	Measuring range : 10 mV ~ 10 V	Power meter	Frequency range : At least 9 GHz Measuring range : 0.1 ~ 5 W
DC voltmeter	Measuring range : 0 ~ 300 V Input impedance : 50 k Ω /DC or better		

CONNECTION

For output power and sensitivity check.

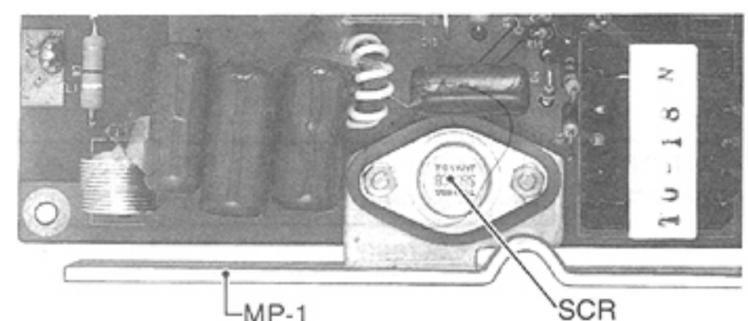


HOW TO DISCHARGE

After unit is turned OFF, electricity is still remain on the 275 V line. Be careful not to short another parts or line.

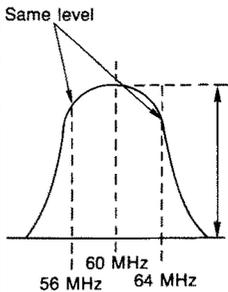
- After removing the PA shield cover, top of SCR on the PA UNIT ground to the earth line.

Just short between cooling body (MP-1) and top of SCR with the screwdriver with an insulated grip.

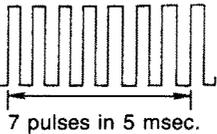


6-2 SCANNER UNIT ADJUSTMENT

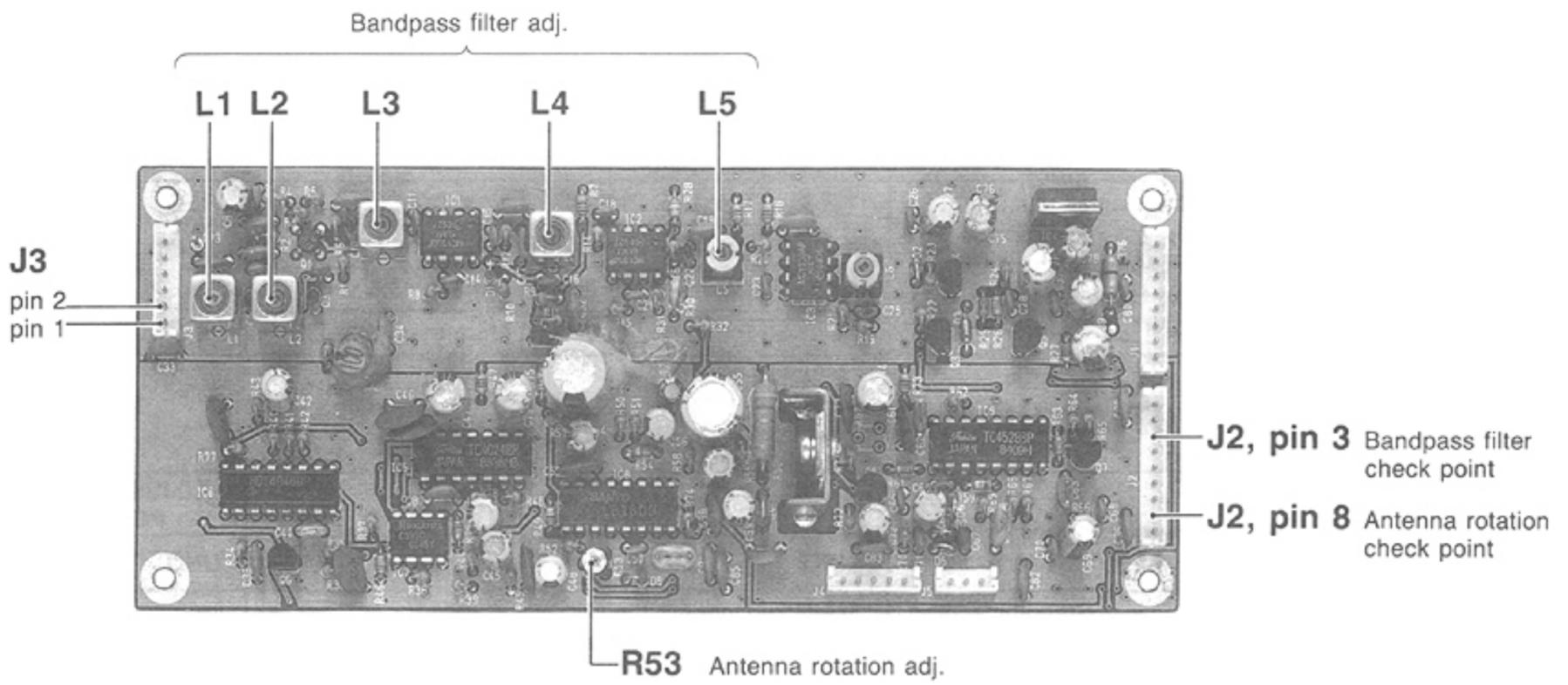
RECEIVER CIRCUIT

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
BANDPASS FILTER	1	<ul style="list-style-type: none"> Screen : Stand-by screen Screen range : 0.5 NM (Set the range in the stand-by screen.) [SCANNER MT] switch : OFF Connect the sweep generator to J3, pins 1 and 2 on the IF UNIT. Set the sweep generator; Center frequency : 60 MHz Bandwidth : 10 MHz Level : -70 dBm Adjust the [GAIN] control not to exceed the output wave form. 	IF	Connect the oscilloscope to J2, pin 3 via the detector.	Adjust as follows: 	On the IF unit <ul style="list-style-type: none"> For peak level of the center freq.: L3, L4 For max. wave form: L5, L6 For the same level on 56 and 64 MHz: L1, L2 For wave peak location in the center: L3 	
SENSITIVITY CHECK	1	<ul style="list-style-type: none"> Screen : Stand-by screen Screen range : 2 NM (Set the range in the stand-by screen.) [SCANNER MT] switch : OFF Set the signal generator; Frequency : 9410 MHz Level : -45 dBm [GAIN] control : Max. CW. [STC] control : Max. CCW. 	HARNESS	Connect the AC milli-voltmeter to the check terminals (pins 1 and 2)	Minimum level	FRONT PANEL	[TUNE] control
	2	<ul style="list-style-type: none"> Set the signal generator; Frequency : 9410 MHz Level : -70 dBm 			Maximum level	Set the signal generator output level.	
	3				10 dB lower than the level displayed on the AC milli-voltmeter in step 2 above.	Verify that the signal generator output level plus insertion loss is less than -85 dBm	
	4	<ul style="list-style-type: none"> Screen range : 0.5 NM Change the signal generator output level: -30 dBm, -70 dBm 			Repeat steps 1 ~ 3.	Verify that the signal generator output level plus insertion loss is less than -70 dBm	

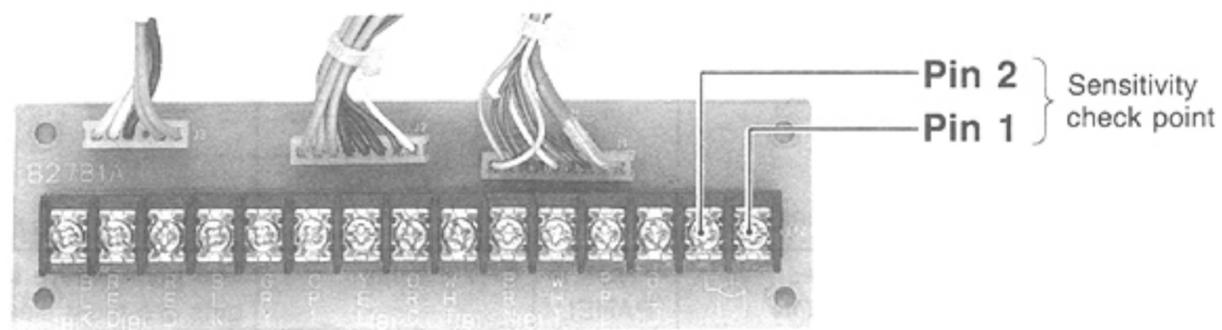
ANTENNA ROTATION AND VOLTAGE CHECK

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
ANTENNA ROTATION	1	<ul style="list-style-type: none"> Screen : Stand-by screen [SCANNER MT] switch : ON 	IF	Connect the oscilloscope to J2, pin 8.	1400 Hz 	IF	R53
VOLTAGE CHECK	1	<ul style="list-style-type: none"> Screen : Stand-by screen [SCANNER MT] switch : ON 	PA	Connect the DC voltmeter to CP2.	240 V ~ 290 V DC		Verify
	2			Connect the oscilloscope between CP3 and CP4.	12 ~ 14 Vp-p		Verify
OUTPUT POWER	1	<ul style="list-style-type: none"> Screen : PPI screen Screen range : 0.5 NM 	ANTENNA	Connect the power meter instead of the antenna.	0.1 ~ 0.3 W		Verify
	2	<ul style="list-style-type: none"> Screen range : 2 NM 			1 ~ 2 W		Verify

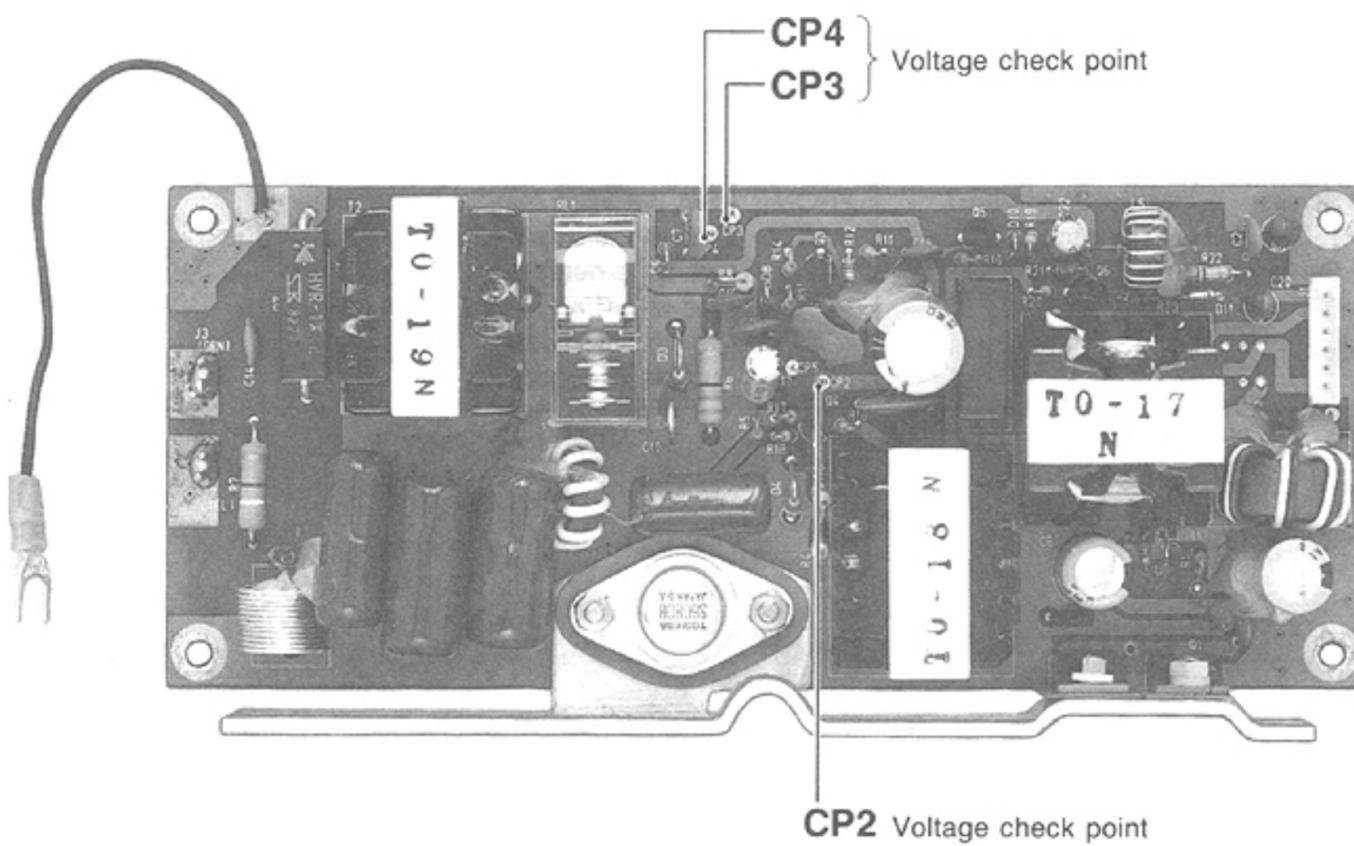
• IF UNIT



• HARNESS UNIT



• PA UNIT



6-3 DISPLAY UNIT ADJUSTMENT

■ VOLTAGE CHECK

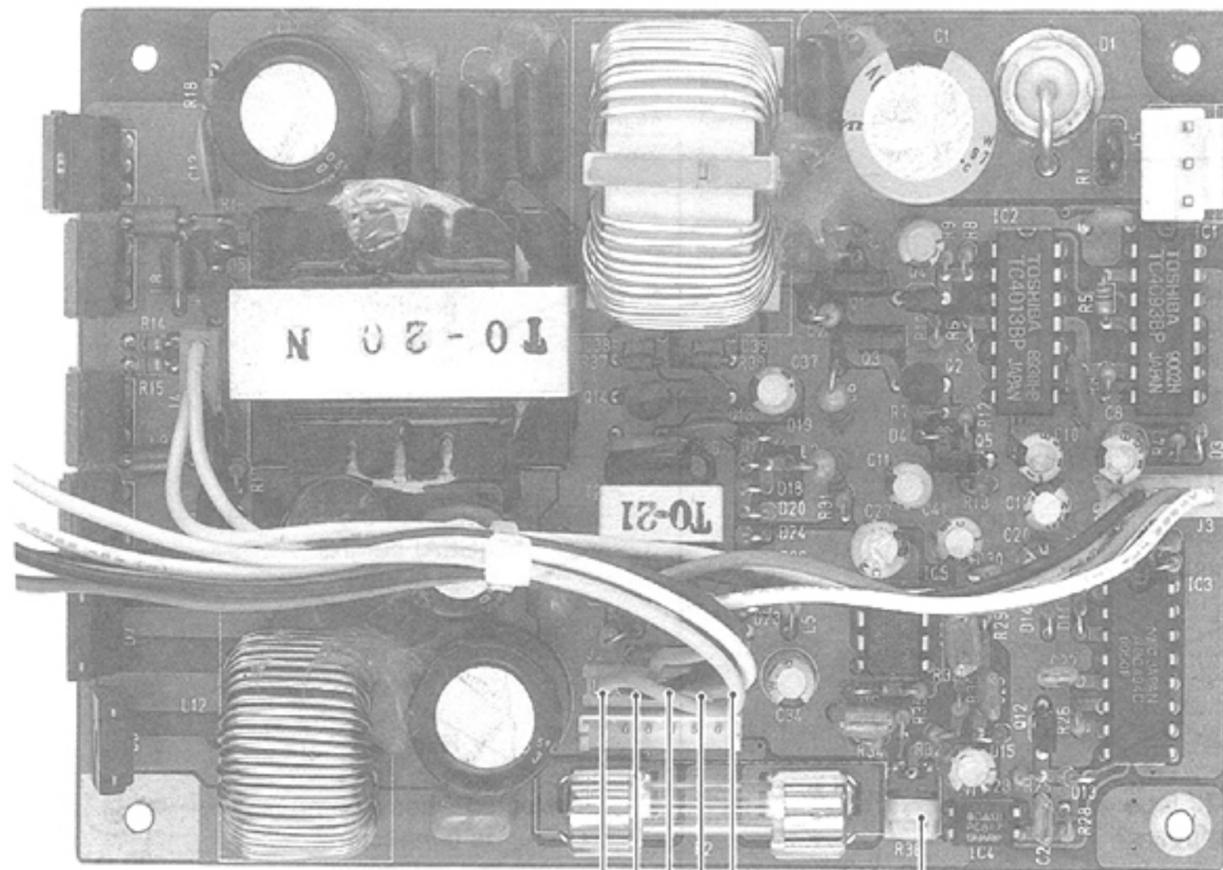
ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT		
			UNIT	LOCATION		UNIT	ADJUST	
OUTPUT	1	<ul style="list-style-type: none"> • Turn ON the display unit. • Screen : Stand-by screen • [SCANNER MT] switch : OFF • Connect the DC voltmeter to J2 on the REG UNIT. 	REG	Pin 3: ⊕ Pin 2: ⊖	12 V DC	REG	R36	
	2			Pin 1: ⊕ Pin 2: ⊖				4.5~5.5 V DC
	3			Pin 4: ⊕ Pin 2: ⊖				-4.5~ -5.5 V DC
	4			Pin 5: ⊕ Pin 2: ⊖				More than 30 V DC
							Verify	

■ CONTROL CIRCUIT ADJUSTMENT

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
TARGET INDICATION THRESHOLD LEVEL	1	<ul style="list-style-type: none"> • Screen : Stand-by screen • [SCANNER MT] switch : OFF 	MAIN	Connect the DC voltmeter between the ground and CP1.	- 200mV	MAIN	R83
DISPLAY INTENSITY	1	<ul style="list-style-type: none"> • Screen : Stand-by screen • [SCANNER MT] switch : OFF • Select the brightest intensity with the [BRT] switch. 	FRONT PANEL	CRT display	Brightest intensity with no distortion.	MAIN	R21
GAIN CONTROL PRESET POSITION	1	<ul style="list-style-type: none"> • Connect the scanner unit of the same serial number. • Turn power ON again. • Screen : PPI screen • [SCANNER MT] switch : ON • Screen range : 24 NM • [GAIN] control : Center • R69 on the MAIN UNIT : max. CCW. 	FRONT PANEL	CRT display	The point where the back noise just disappears.	MAIN	R71
TUNE CONTROL PRESET POSITION	1	<ul style="list-style-type: none"> • Screen : PPI screen • [SCANNER MT] switch : ON • [TUNE] control : Center 	FRONT PANEL	CRT display	The point where targets are most clearly displayed.	MAIN	R69
SEA CONTROL PRESET POSITION	1	<ul style="list-style-type: none"> • Screen : PPI screen • [SCANNER MT] switch : ON • Screen range : 8 NM • [SEA] control : Max. CW. 	FRONT PANEL	CRT display	The point where the border line is most clearly displayed near the 5 NM line.	MAIN	R74
LEVEL ADJUSTMENT	1	<ul style="list-style-type: none"> • Screen : PPI screen • [SCANNER MT] switch : ON • Screen range : 24 NM • [SEA] control : Max. CCW. • Adjust [TUNE] and [GAIN] control to indicate targets clearly. 	MAIN	Connect the oscilloscope to CP2.	6 Vp-p	MAIN	R29
TIMING ADJUSTMENT	1	<ul style="list-style-type: none"> • Screen : PPI screen • [SCANNER MT] switch : ON • Screen range : 0.25 NM 	FRONT PANEL	Set the VRM marker to the point which is nearest to the target and which has measurable distance.	Same distance	LOGIC	R3

CW : Clockwise CCW : Counterclockwise

• REG UNIT



J2, pin 1 2 3 4 5
Voltage check points

R36 Output voltage adj.

• MAIN AND LOGIC UNITS

R29 Level adj.
CP2 Level check point

R71 Gain adj.
R74 Sea adj.

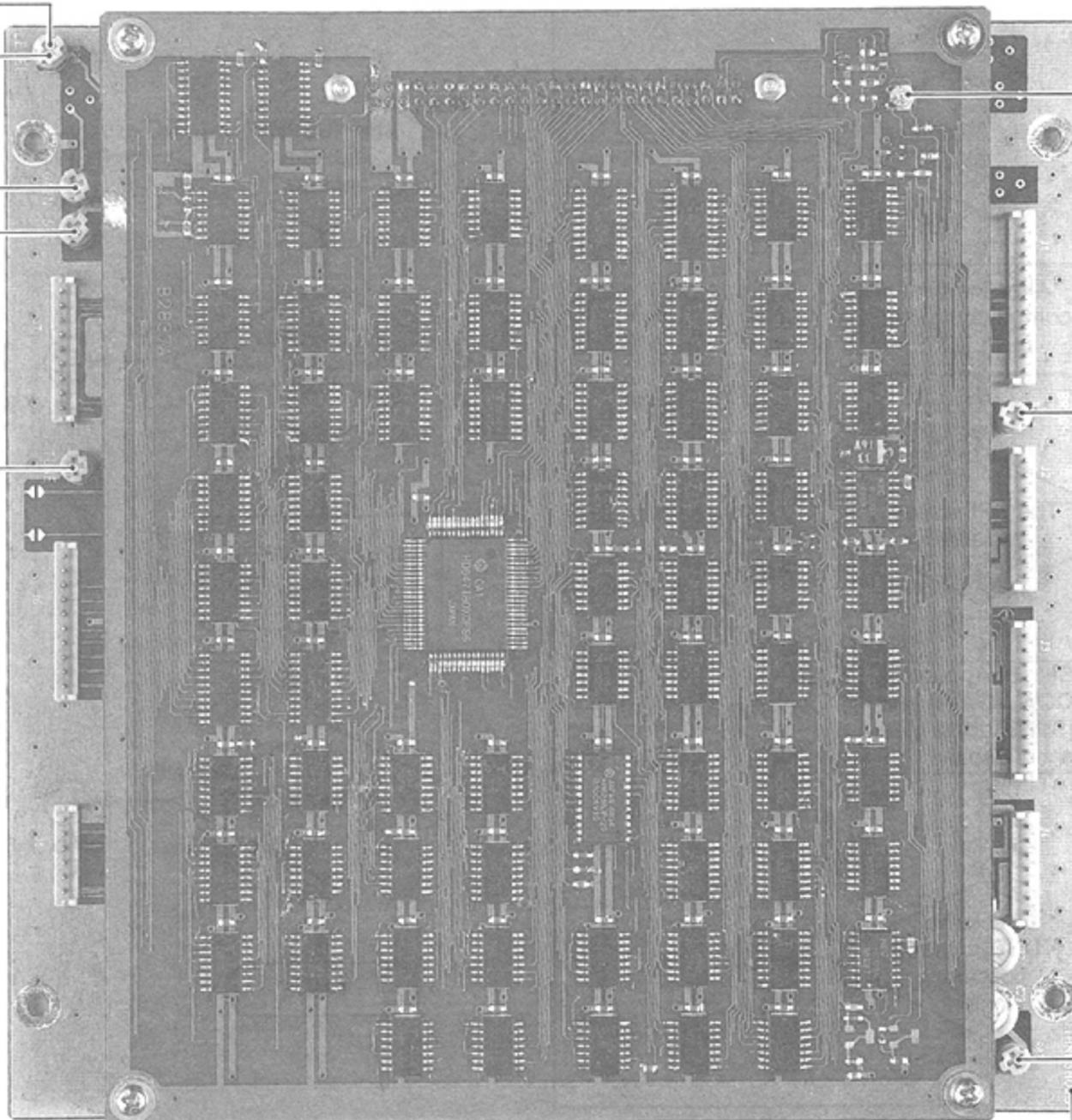
R69 Tune adj.

R3 Timing adj.

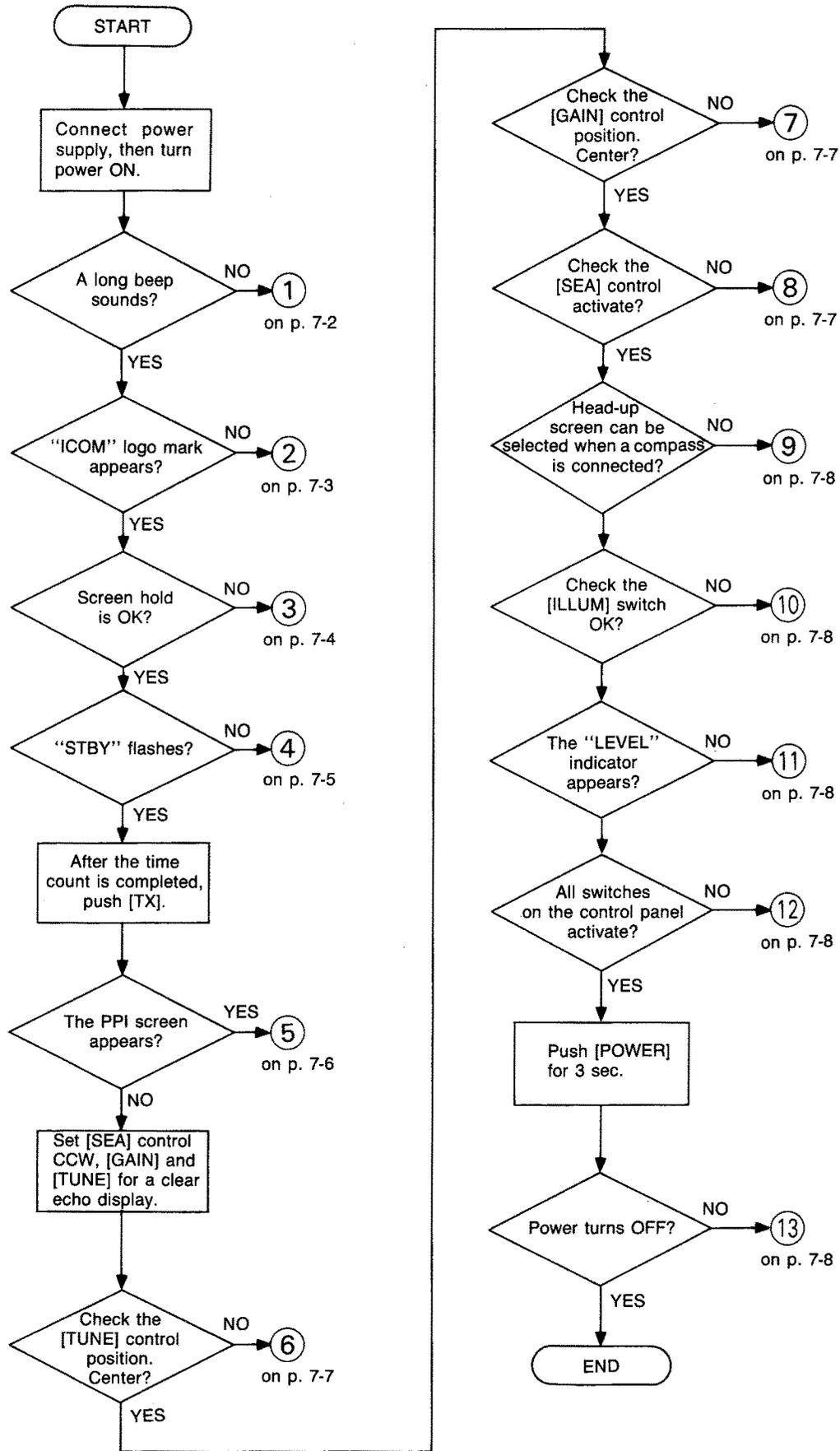
R21 Intensity adj.

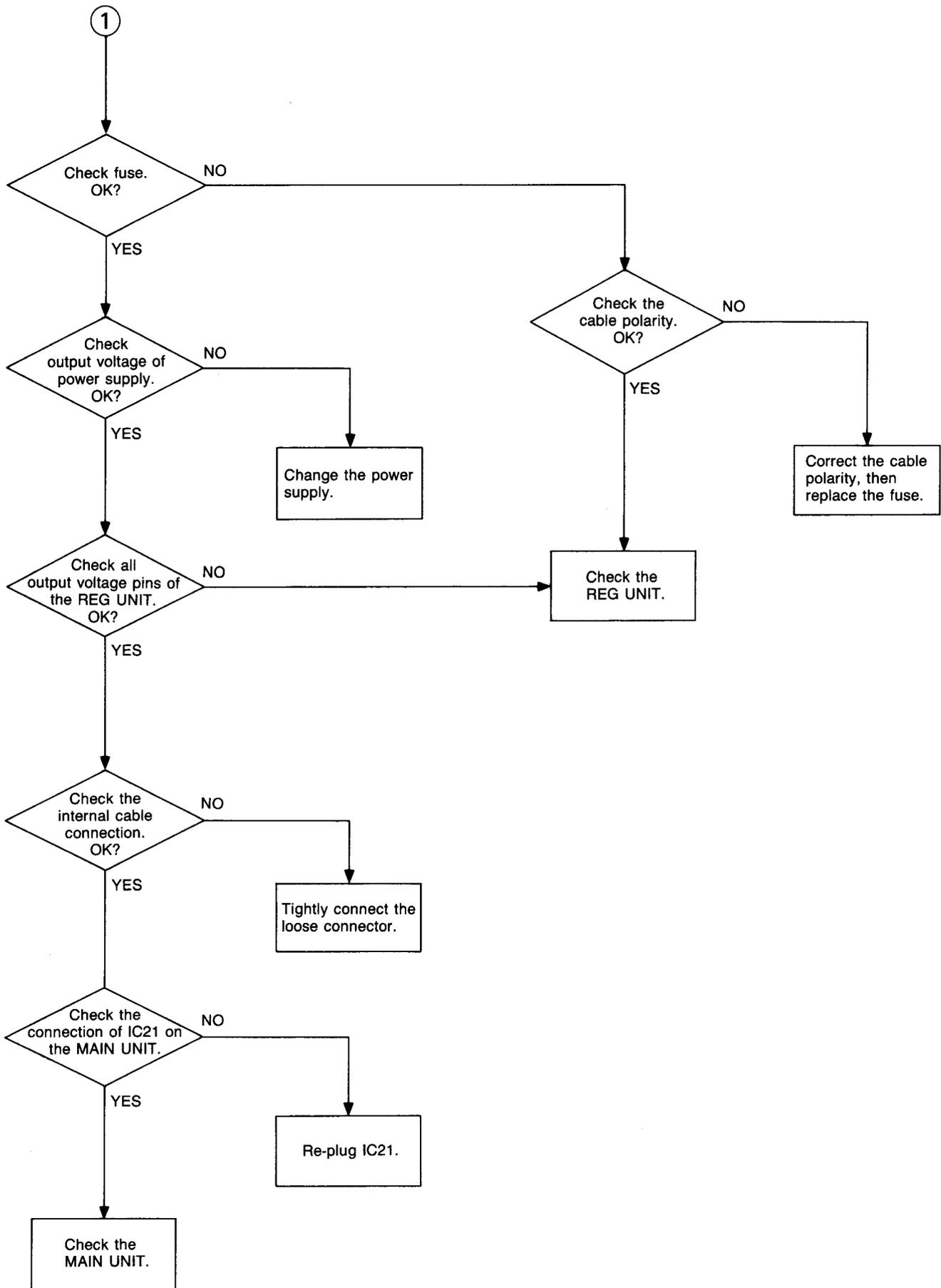
R83 Threshold adj.

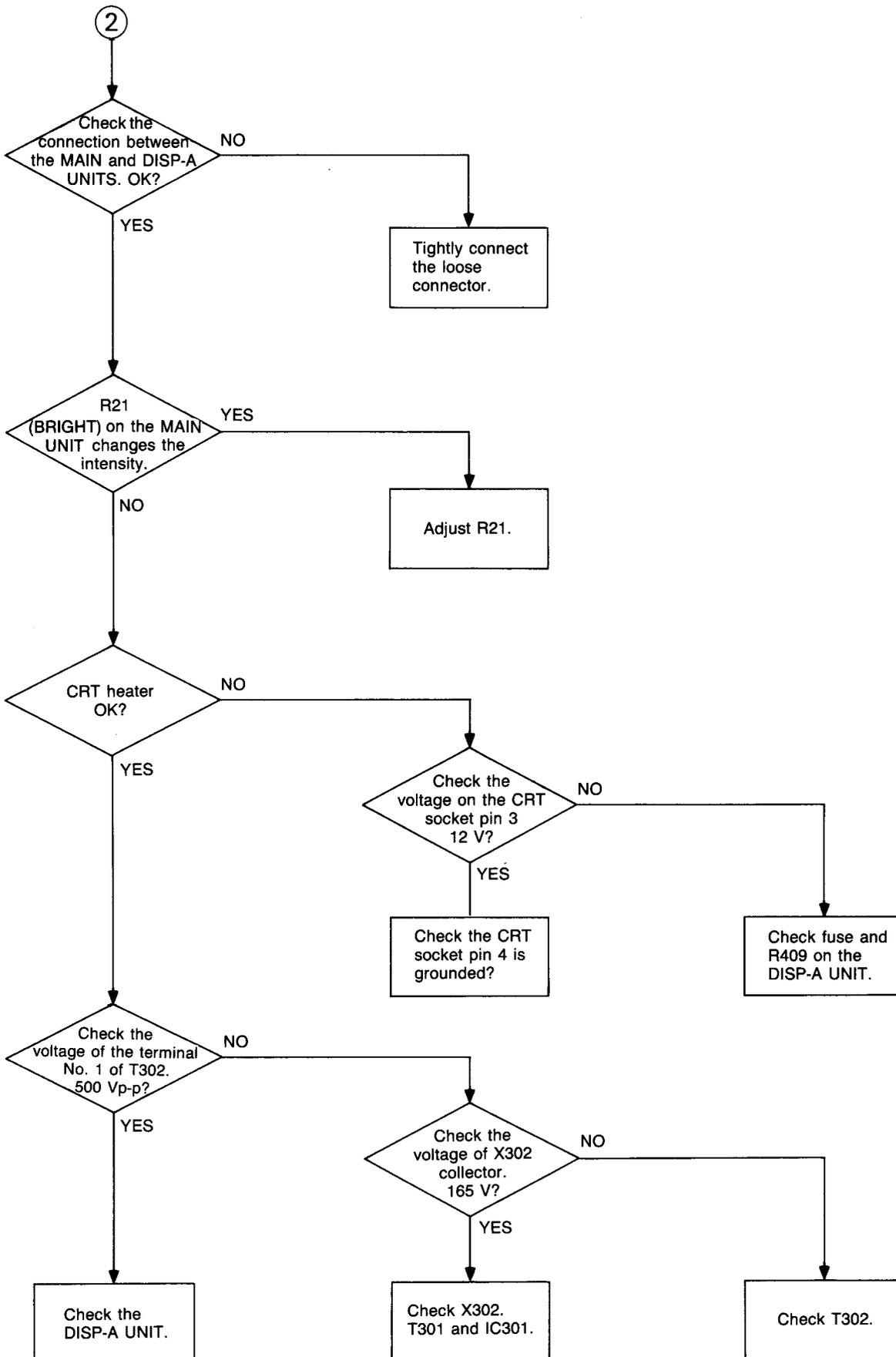
CP1 Threshold check point

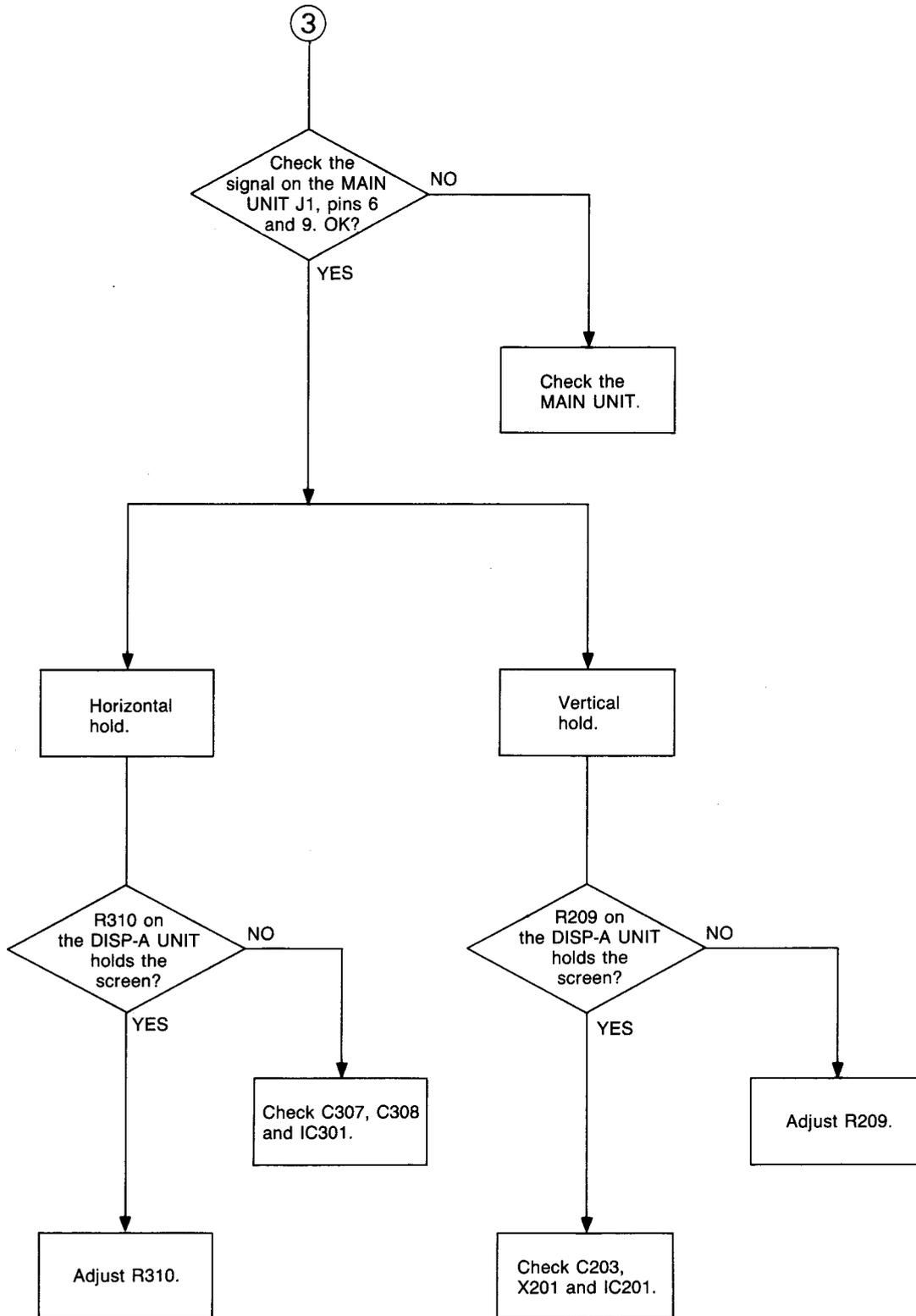


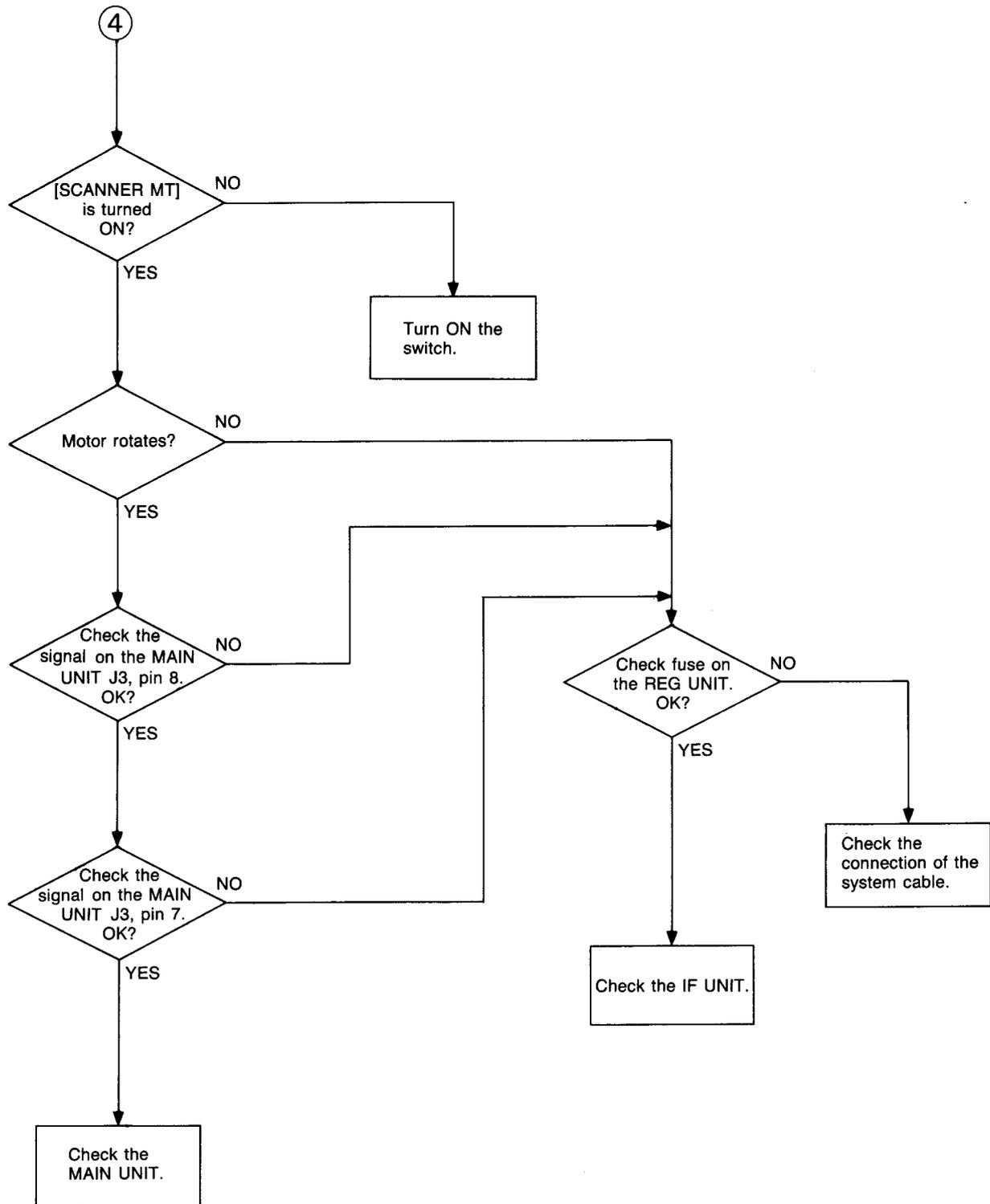
SECTION 7 TROUBLESHOOTING FLOW CHART

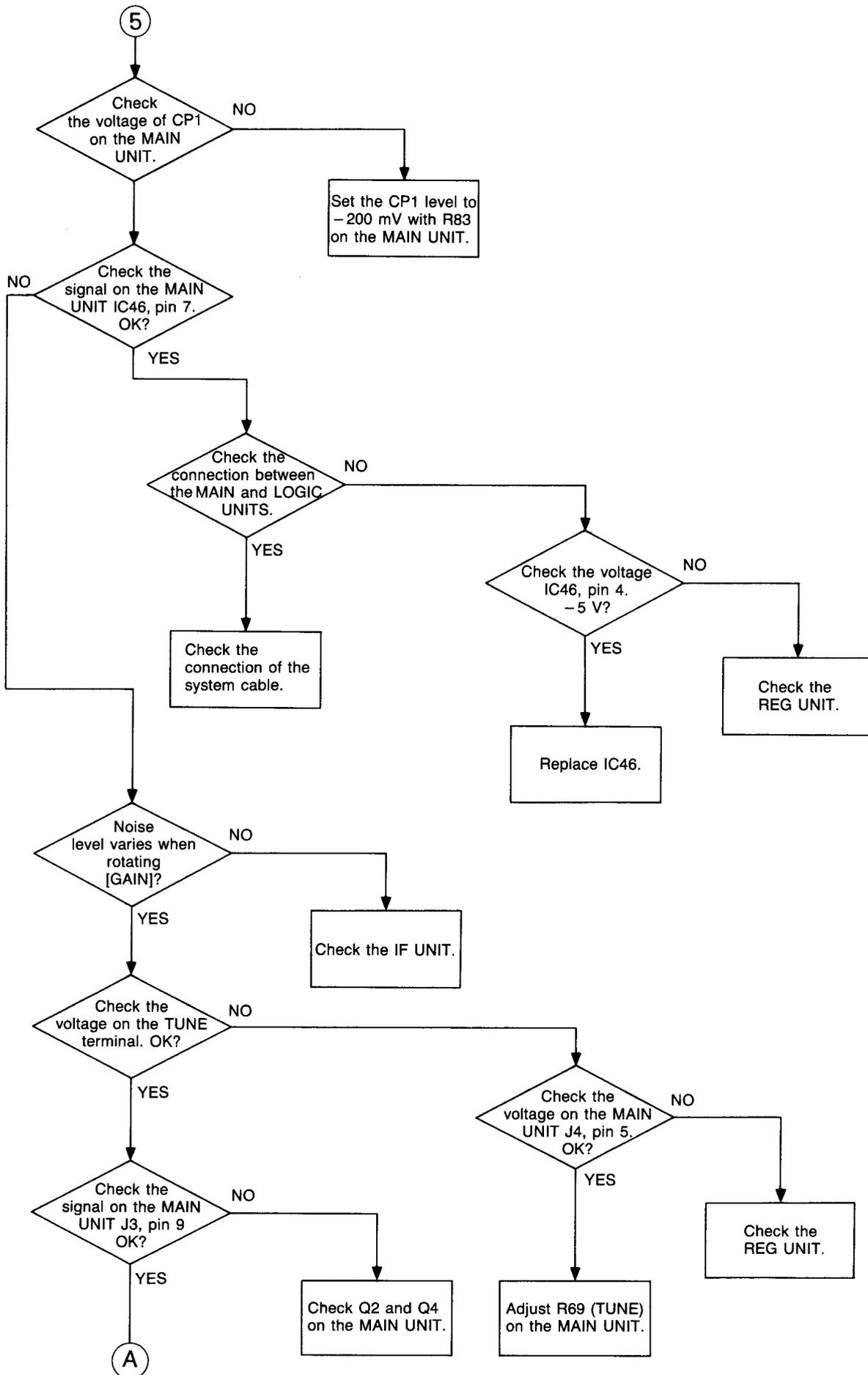


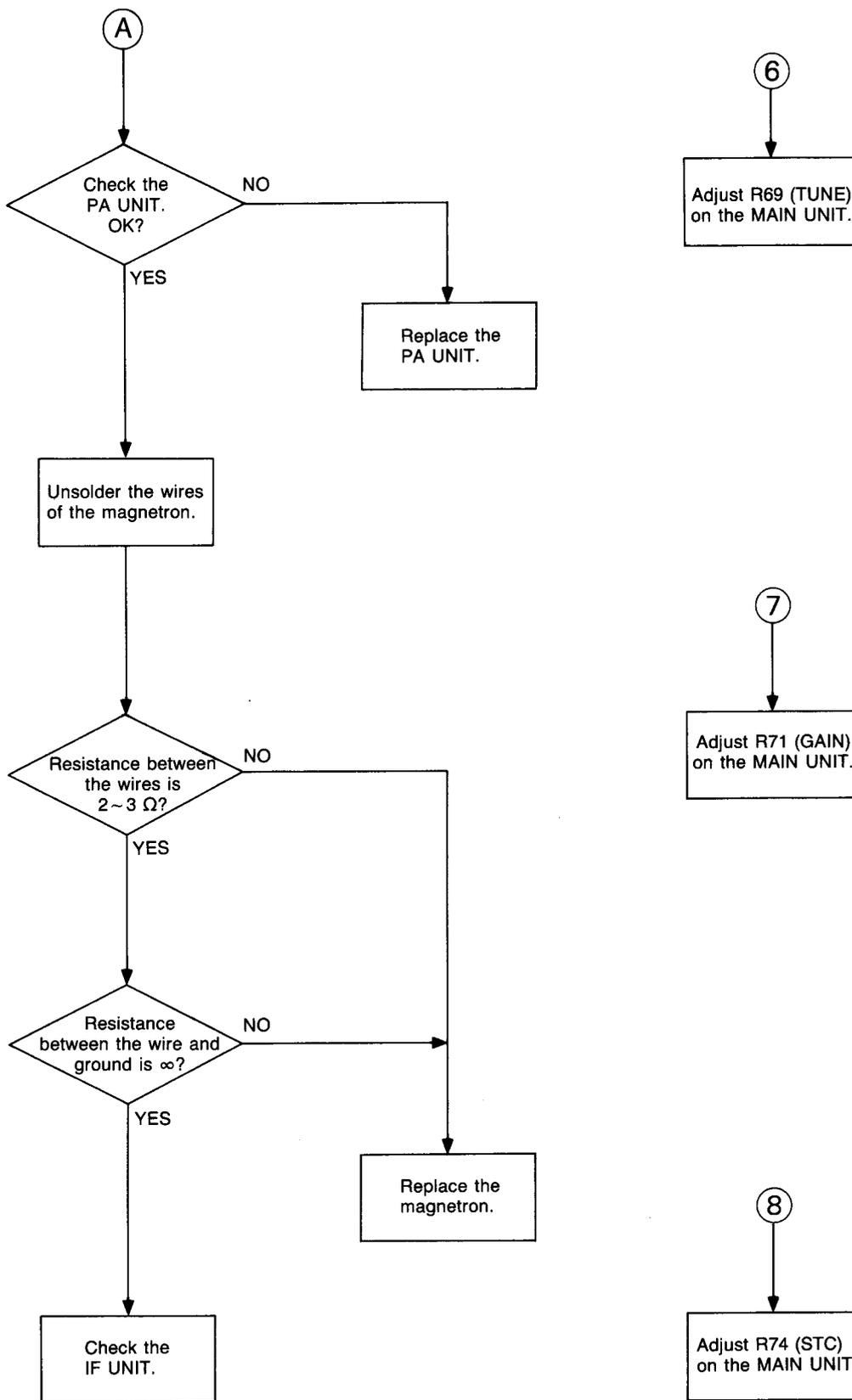


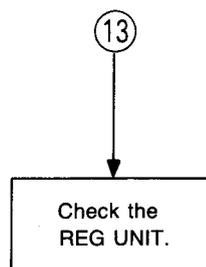
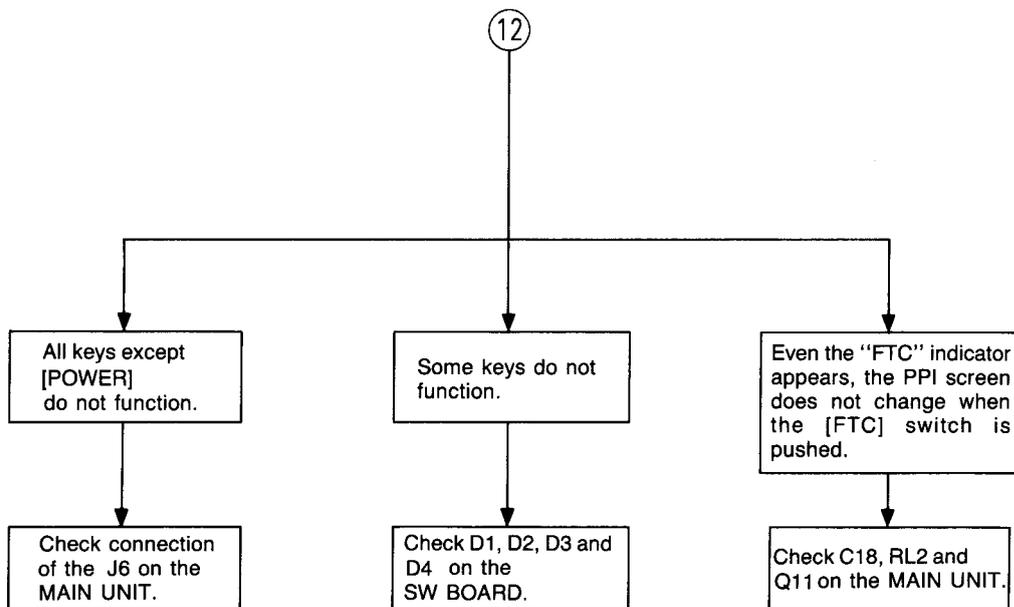
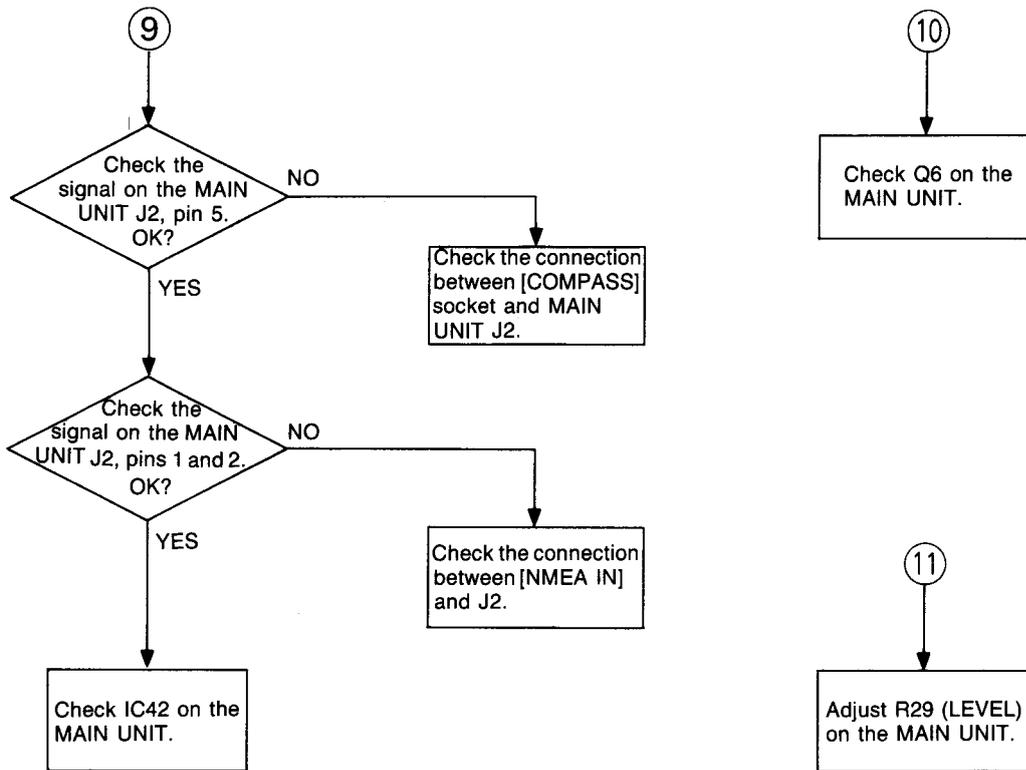




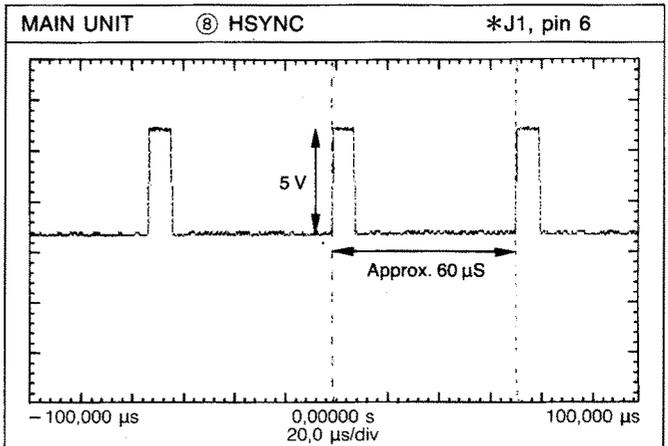
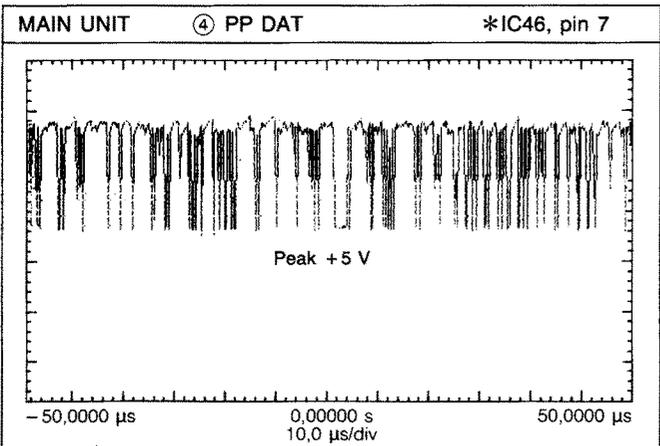
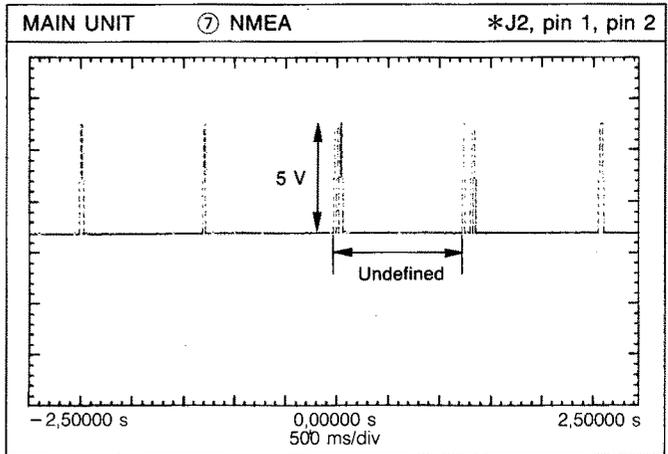
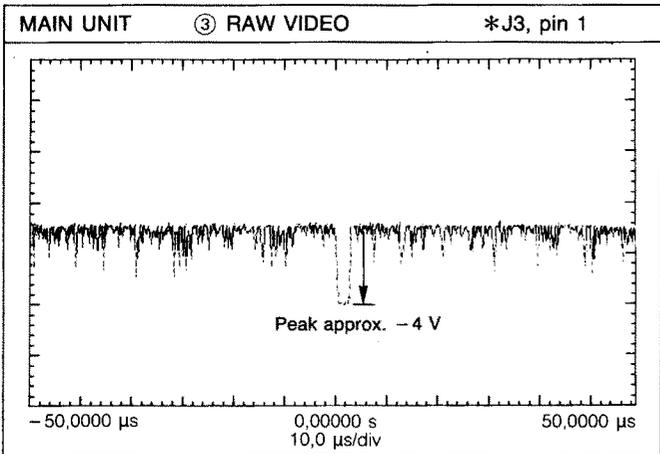
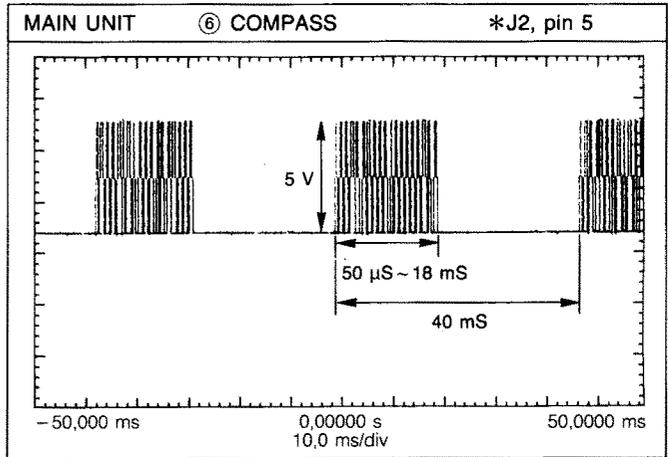
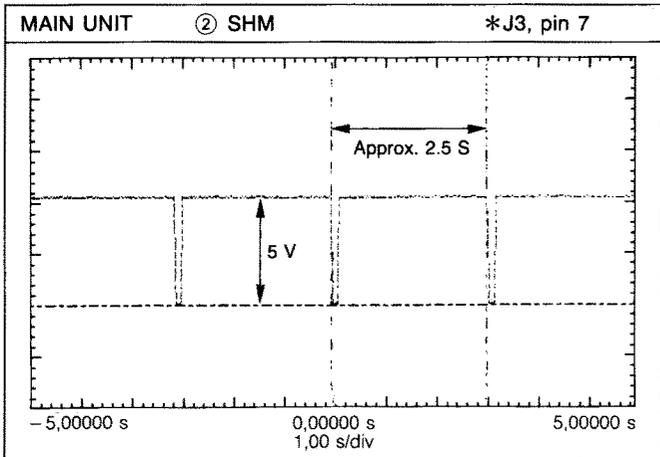
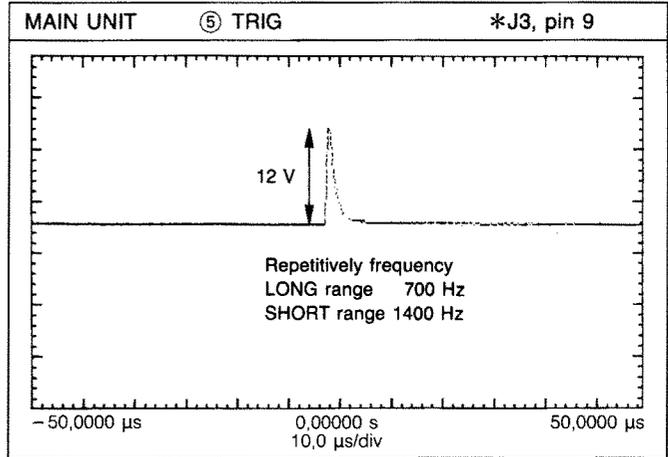
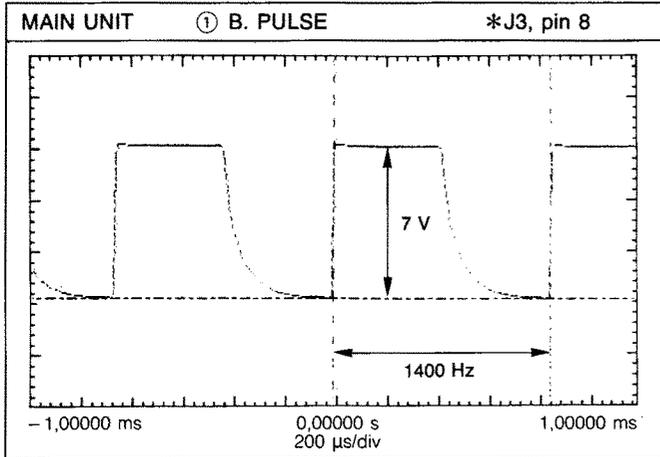


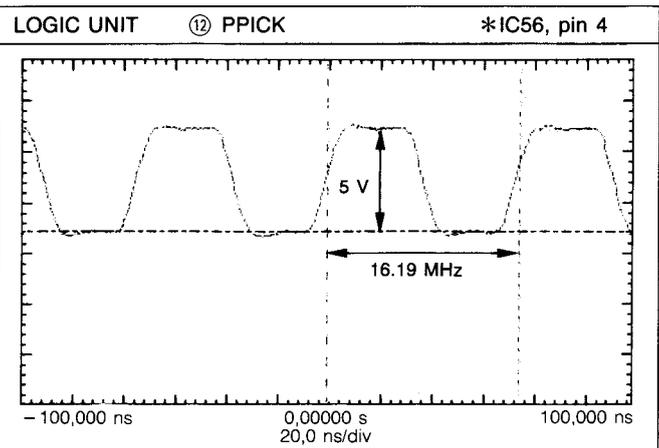
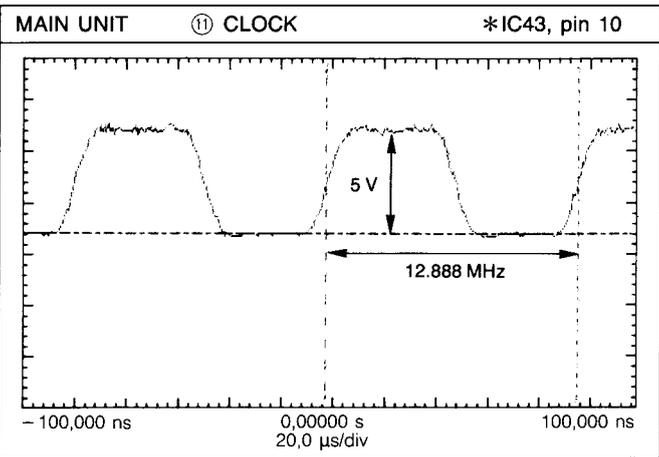
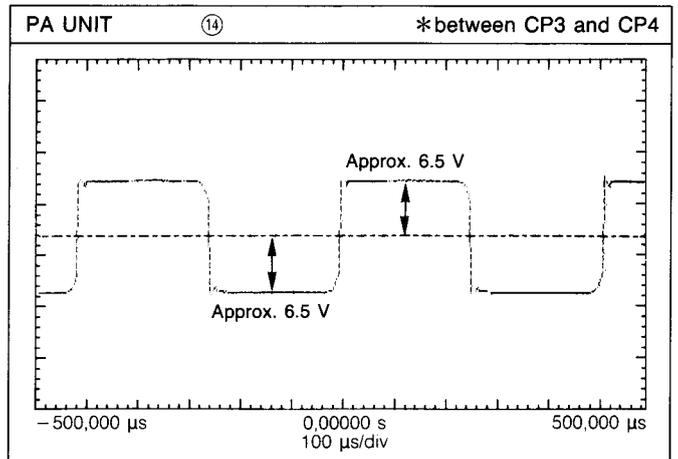
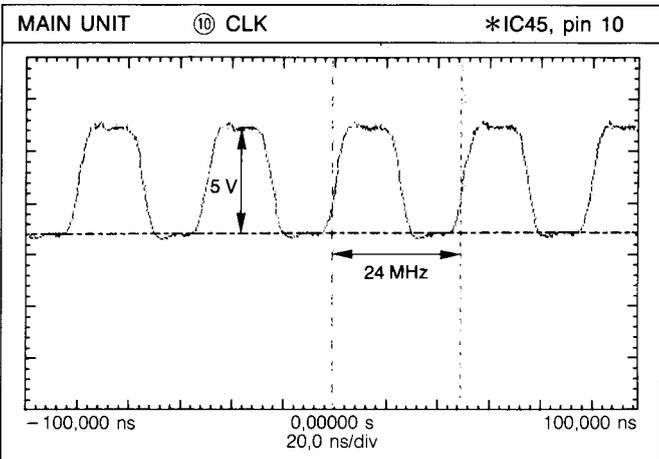
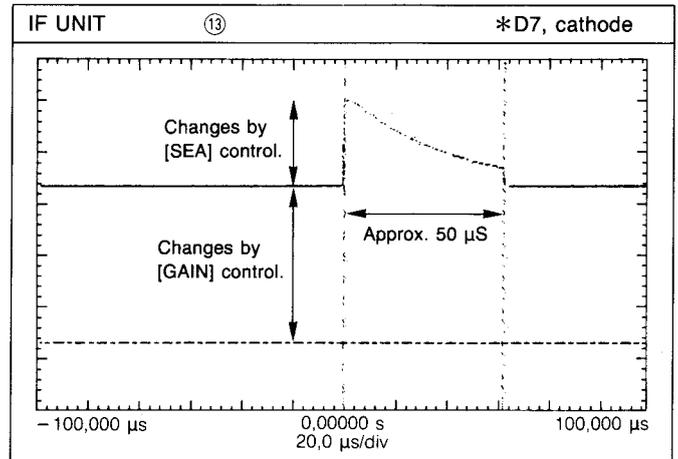
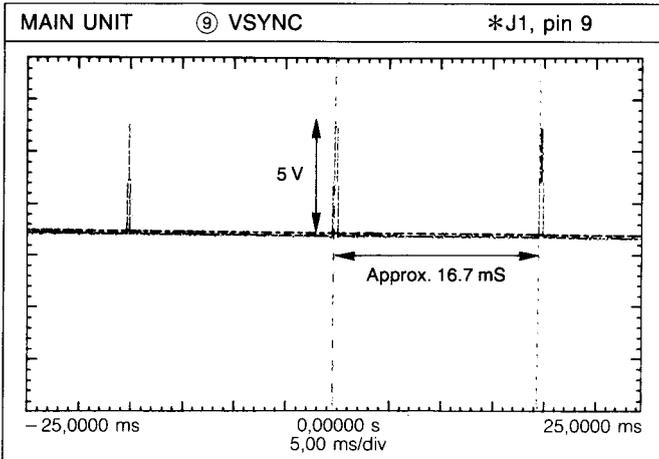






SECTION 8 SIGNAL DESCRIPTIONS

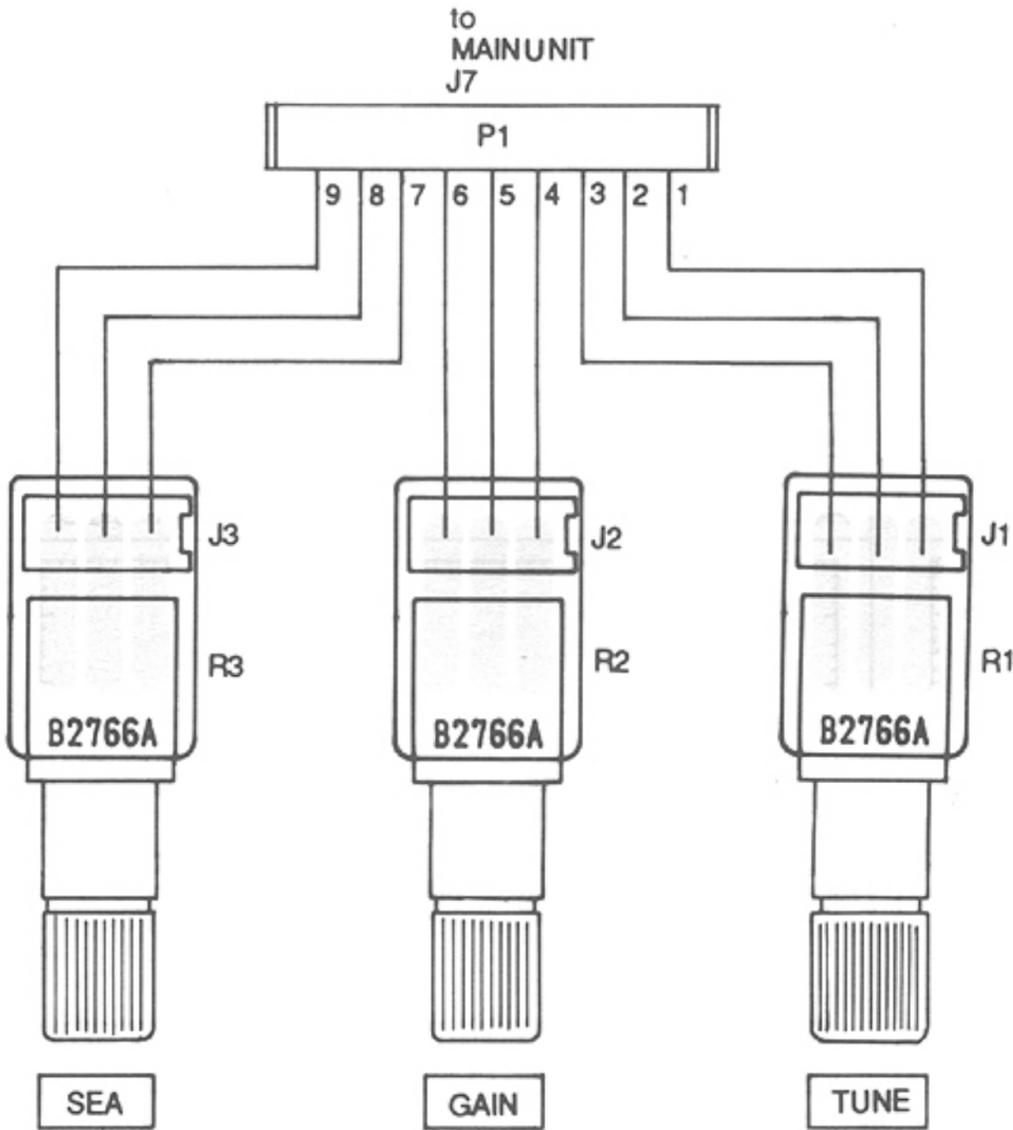




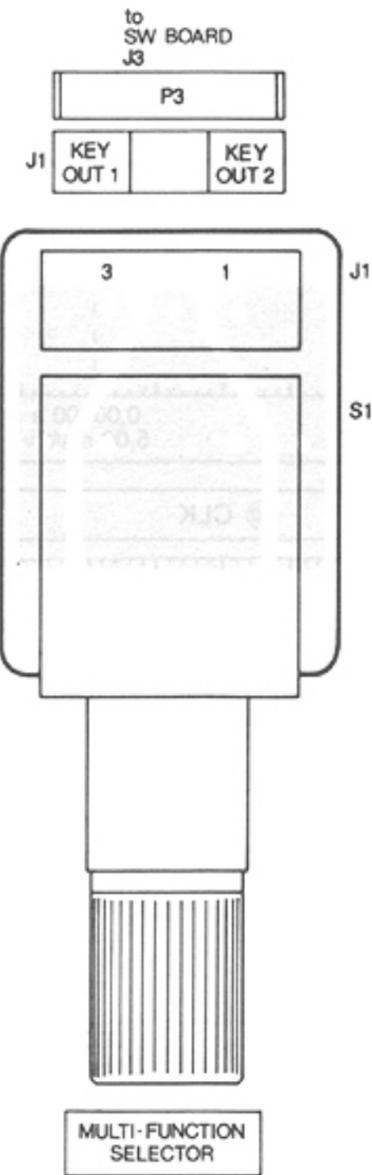
SECTION 9 BOARD LAYOUT

9-1 VOL, SENSOR AND SW UNITS

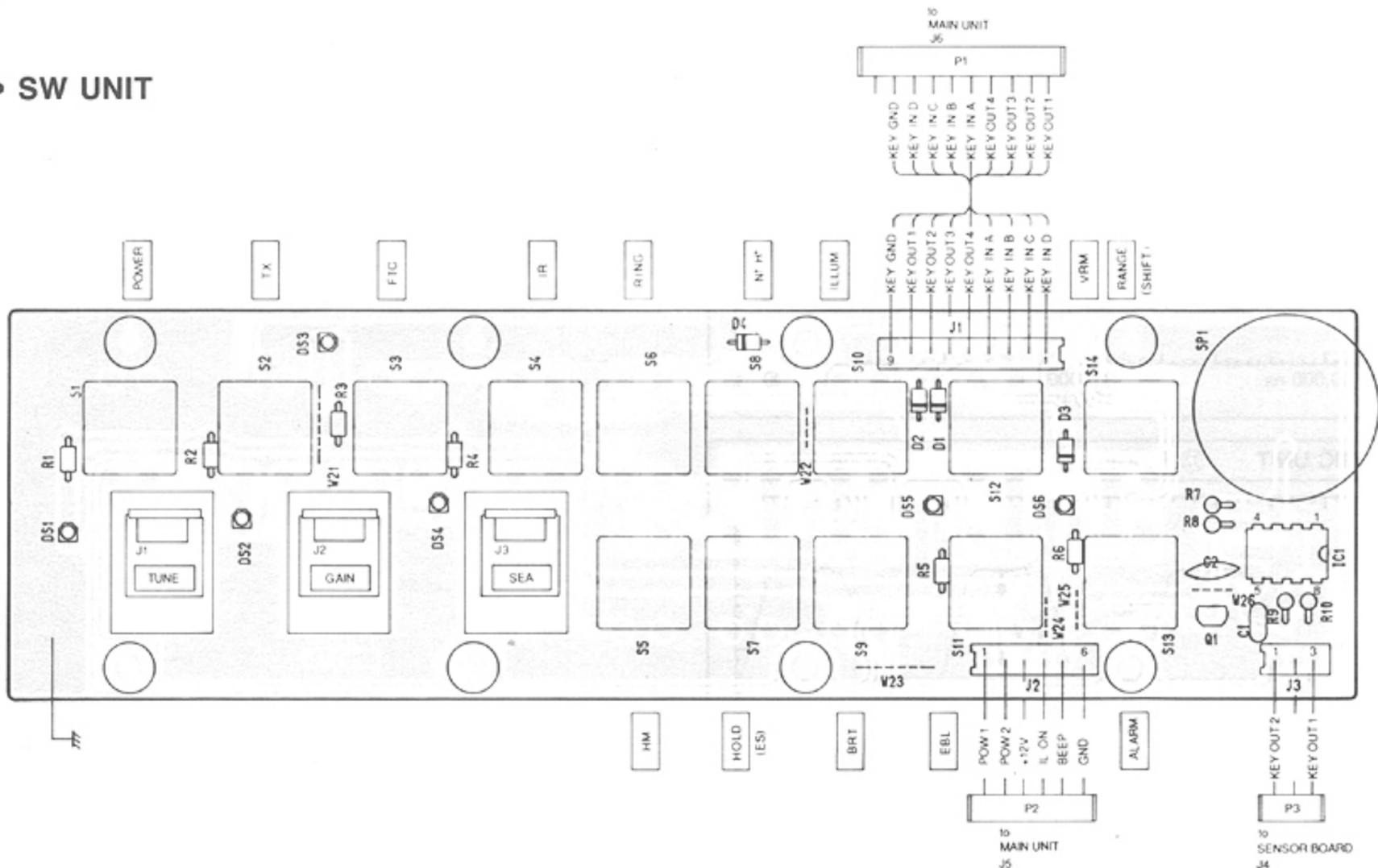
• VOL UNIT



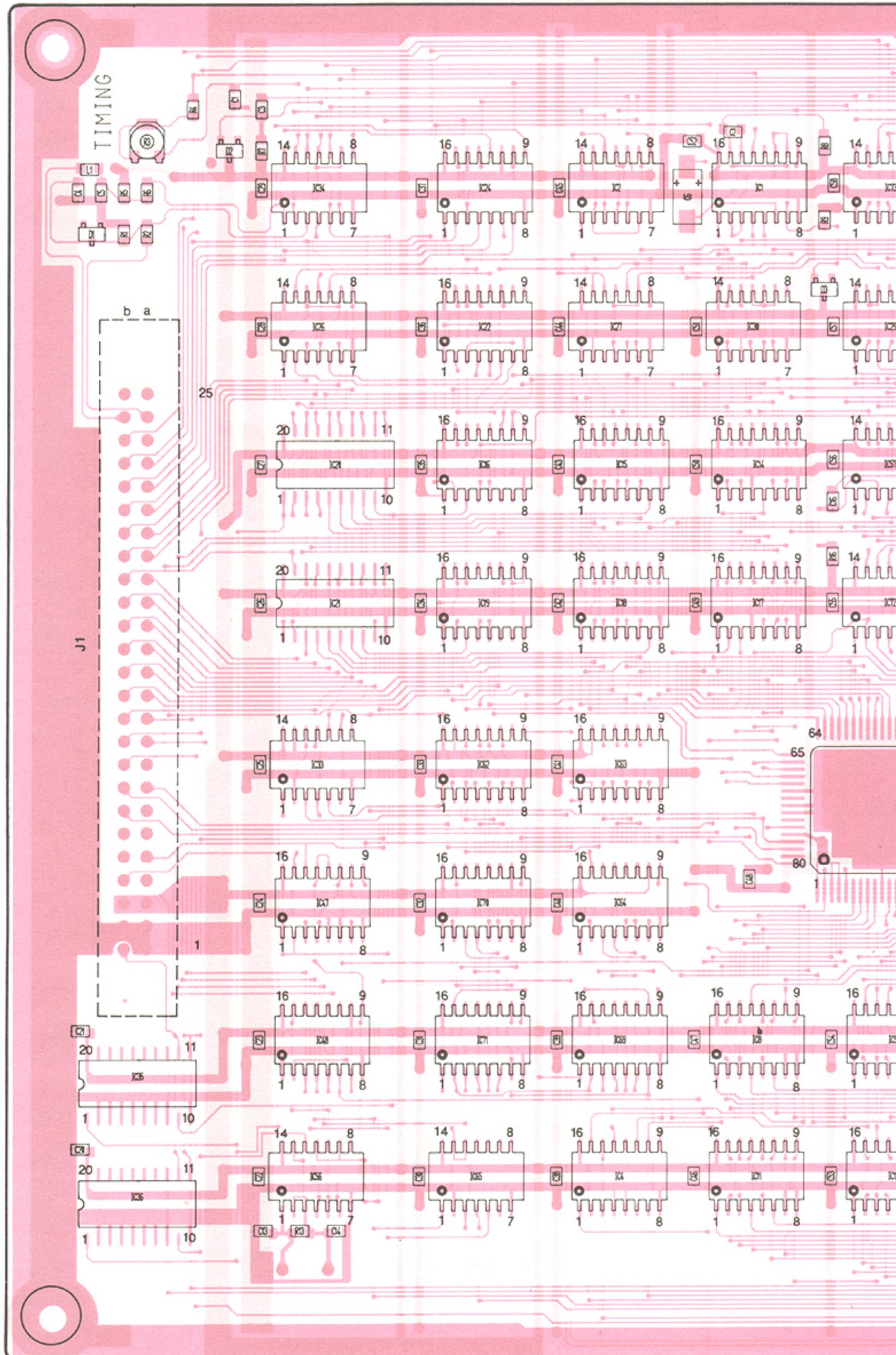
• SENSOR UNIT



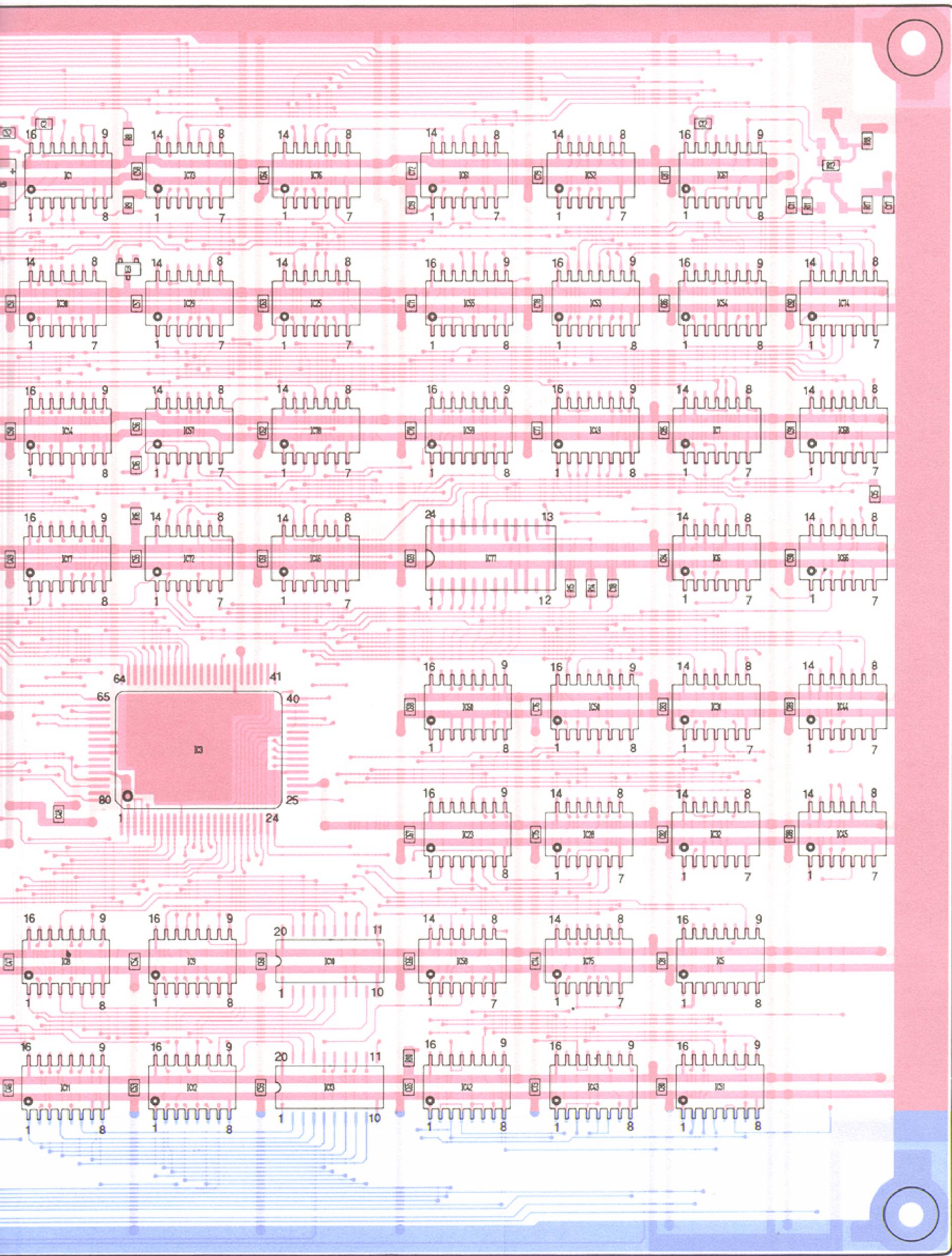
• SW UNIT



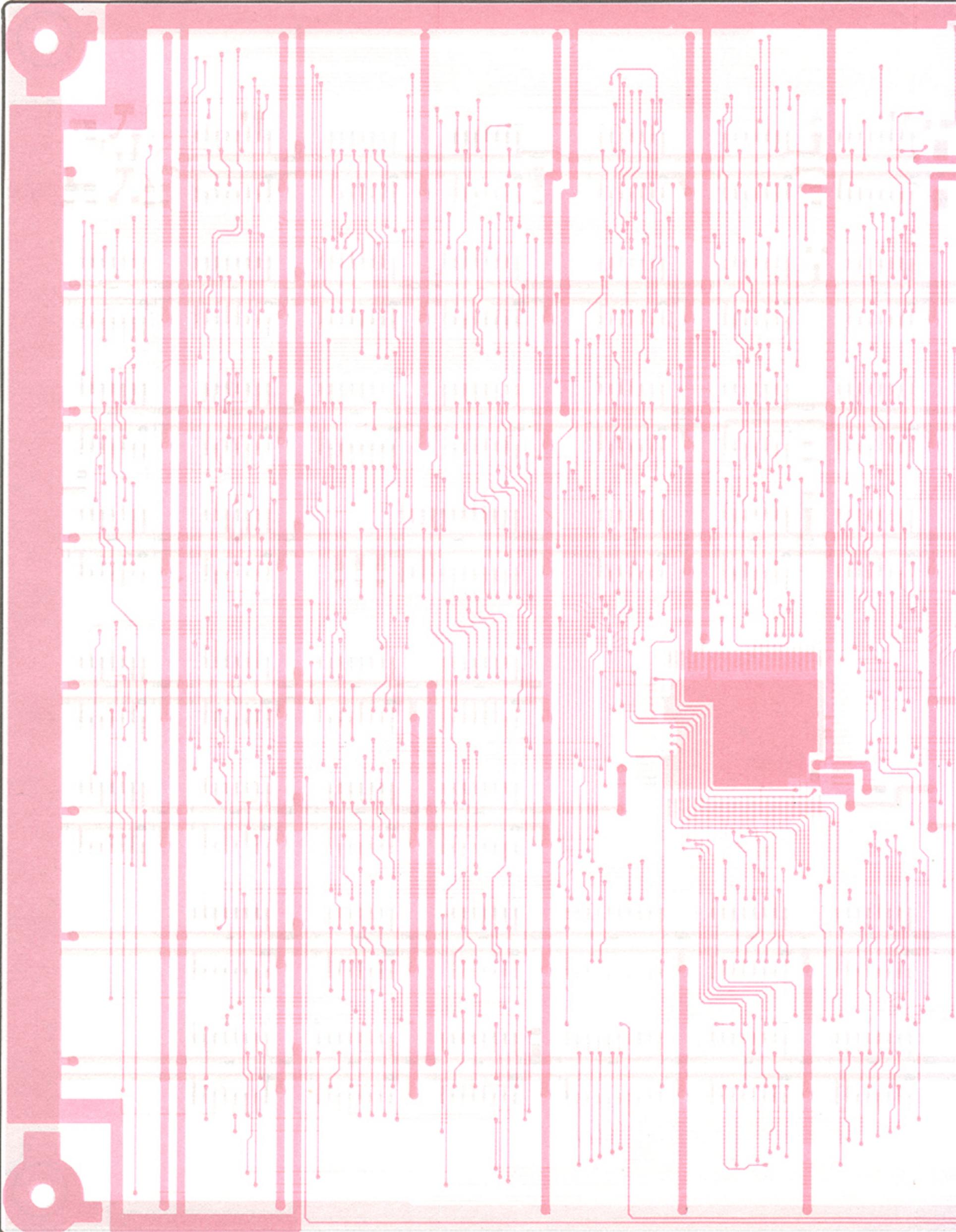
9-2 LOGIC UNIT

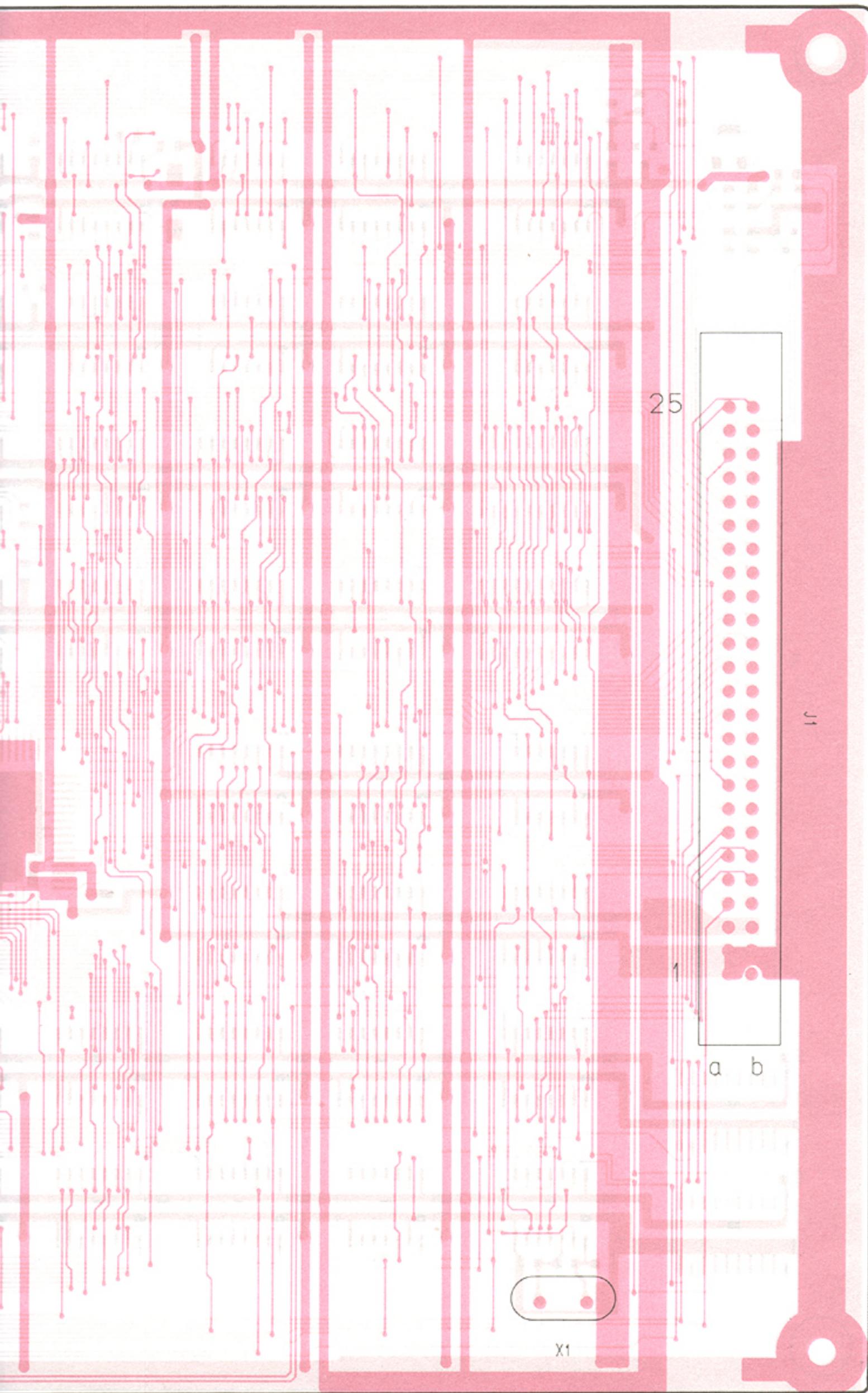


The combination of this page and the next page shows the unit layout in the same configuration as the actual P.C. Board.



• LOGIC UNIT





J1-A
/RESET
B.PULSE
PPI
PPII
GCAS
PCAS
W3
W1
B1
B3
B5
B7
CLOCK
AL.D
TIM OUT
ESON
SHMI
AL.ST
RAA
RAC
RSI
SSL
+5V
GND
GND

to MAIN UNIT
J8-A

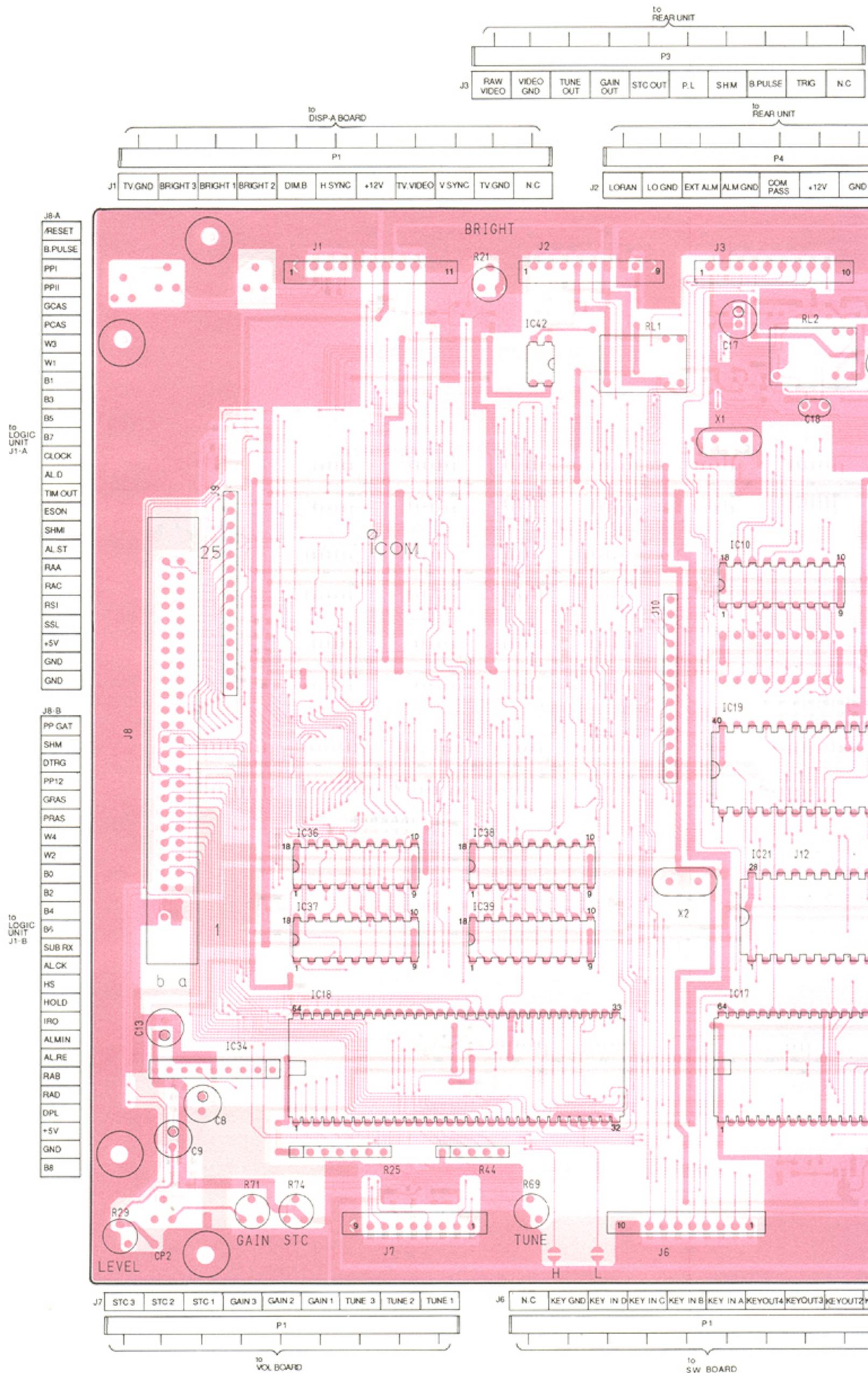
J1-B

PP GAT
SHM
DTRG
PP12
GRAS
PRAS
W4
W2
B0
B2
B4
B6
SUB RX
ALCK
HS
HOLD
IRO
ALMIN
ALRE
RAB
RAD
DPL
+5V
GND
B8

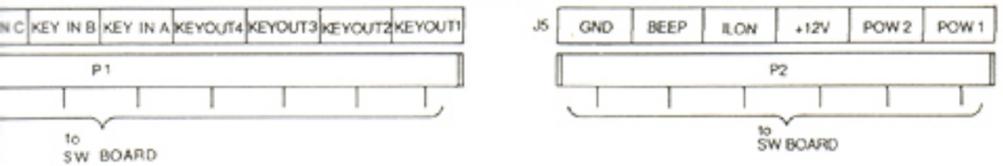
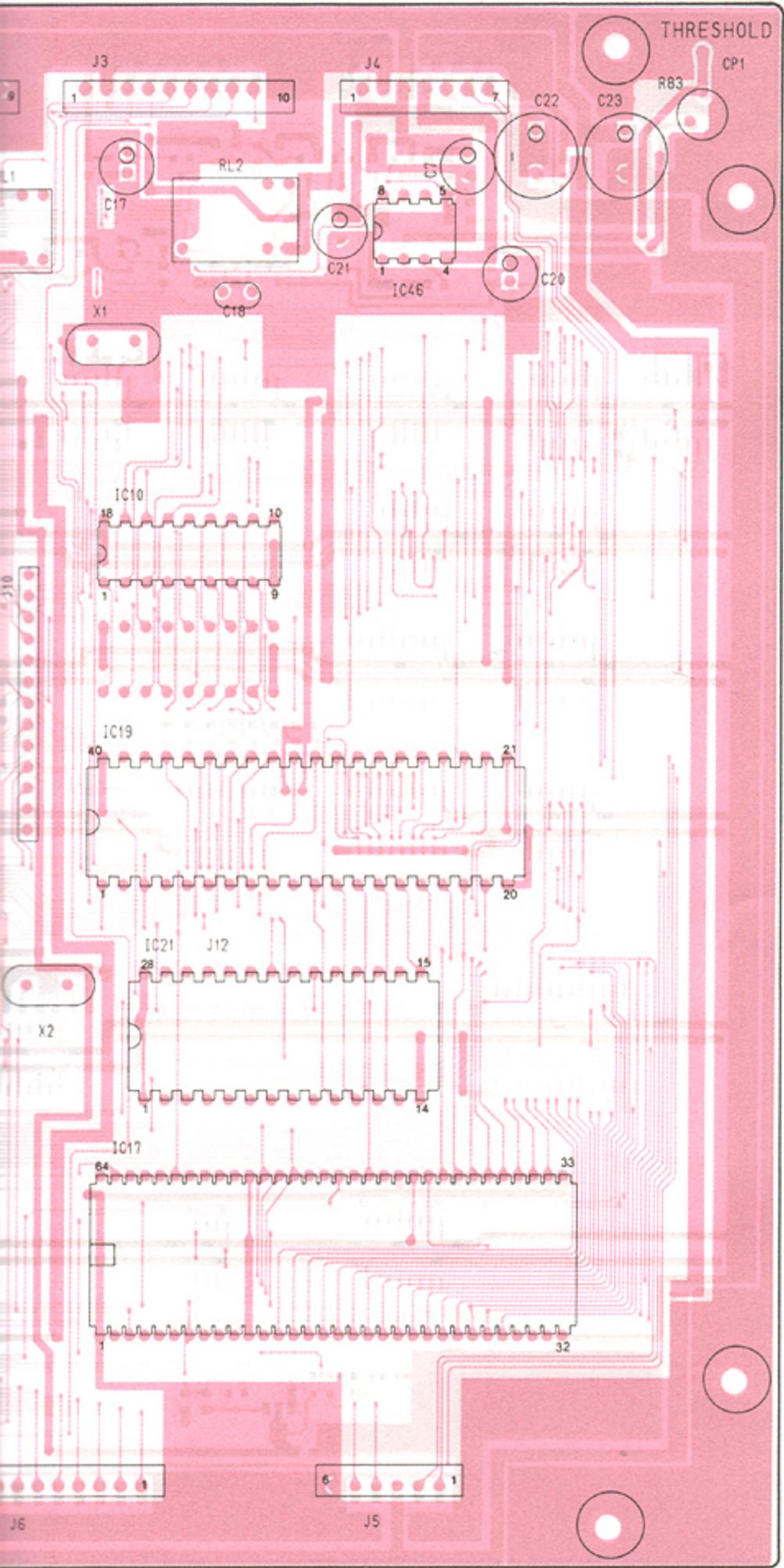
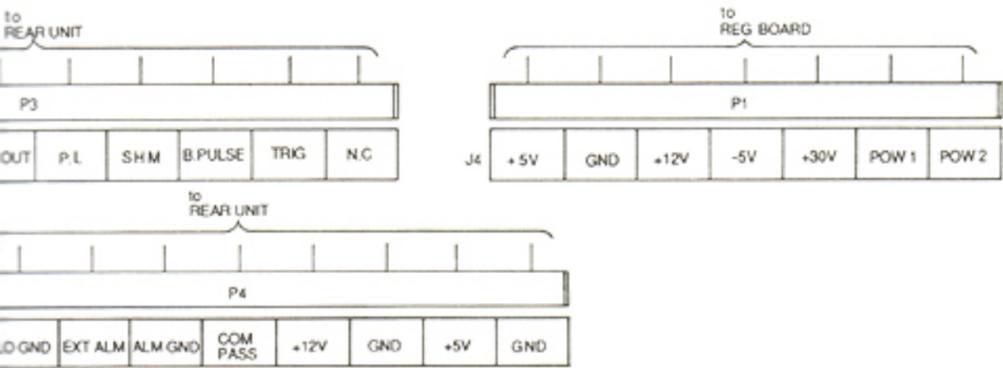
to MAIN UNIT
J8-B

X1

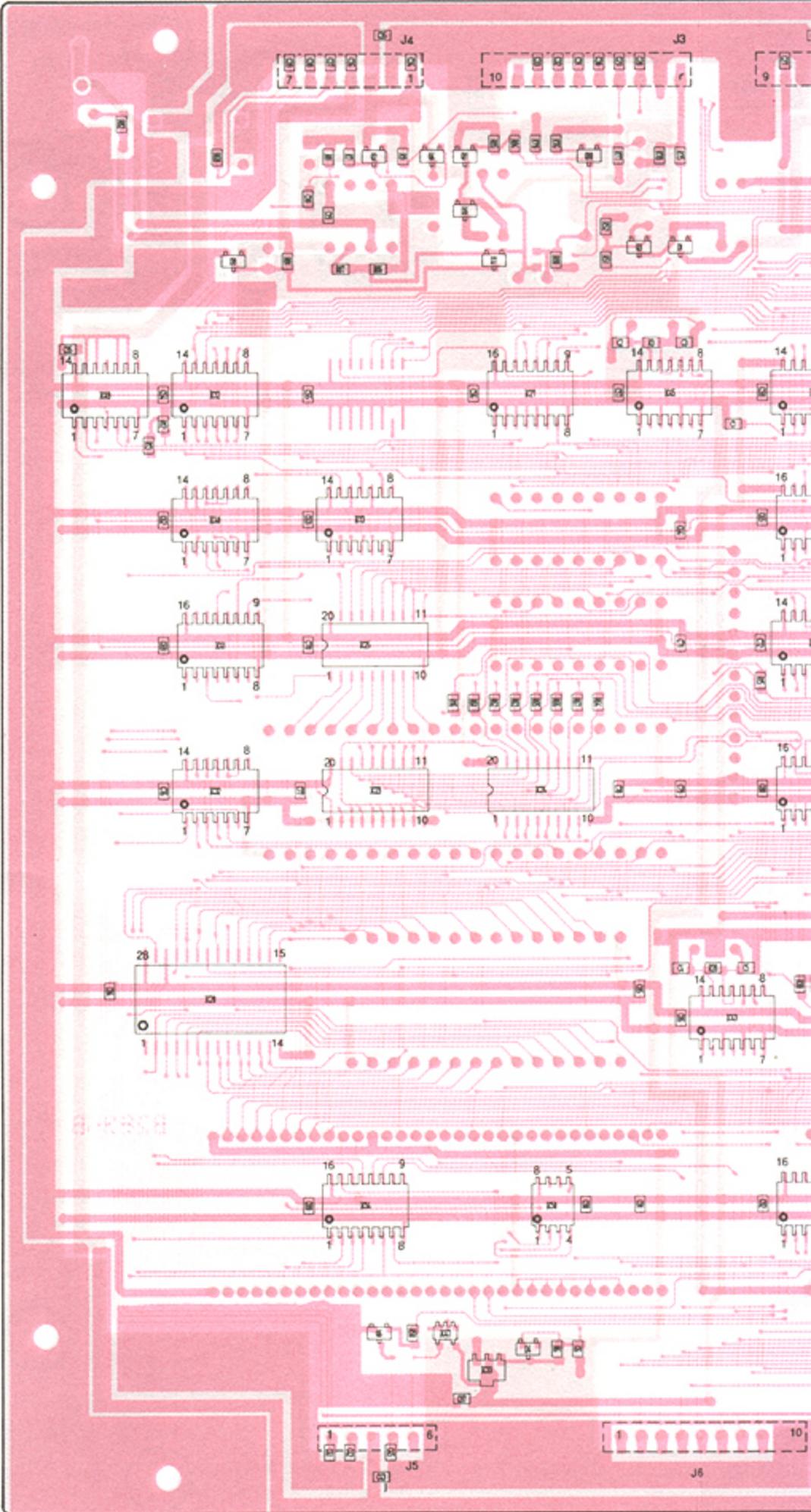
9-3 MAIN UNIT



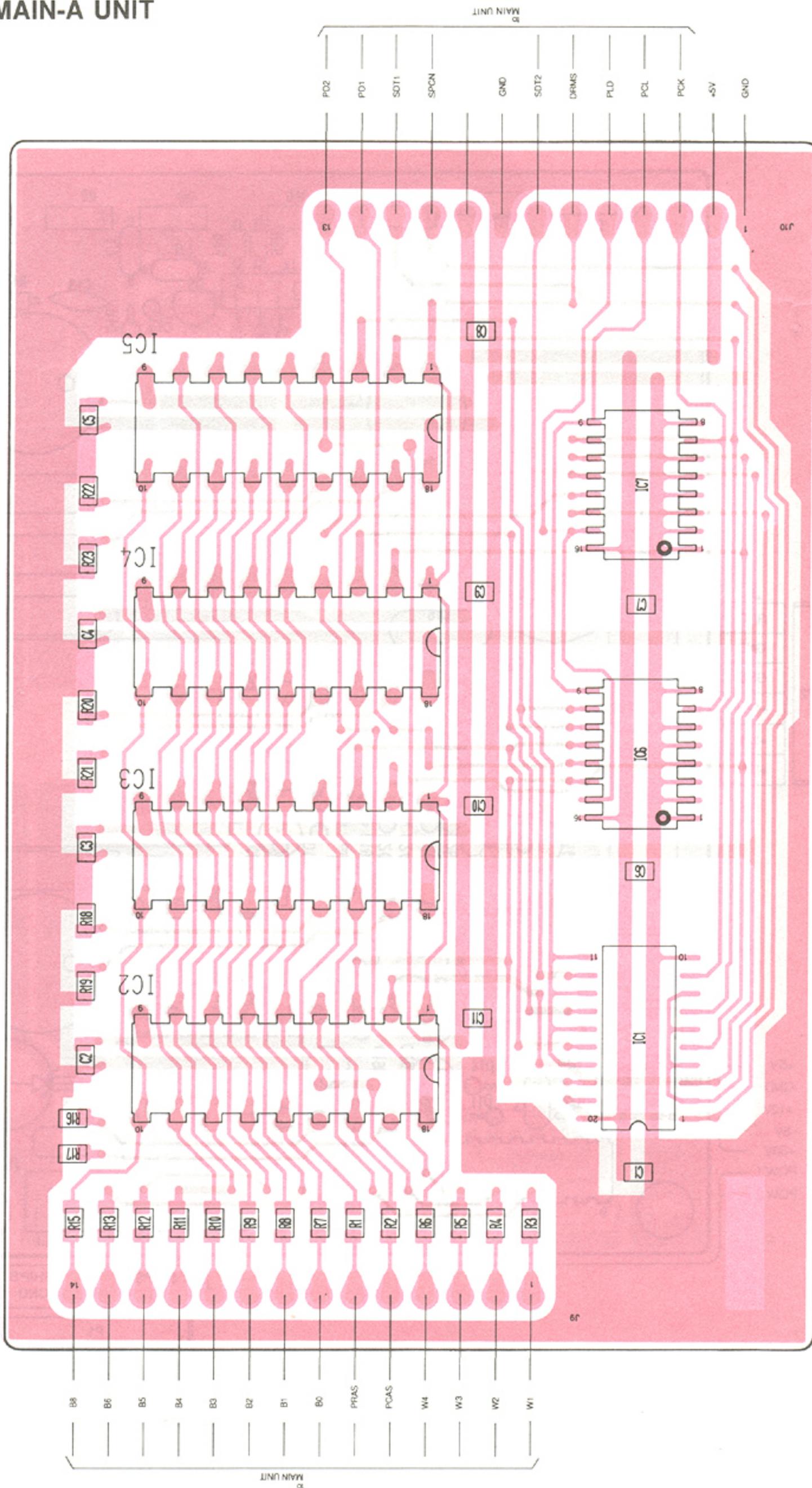
The combination of this page and the next page shows the unit layout in the same configuration as the actual P.C. Board.



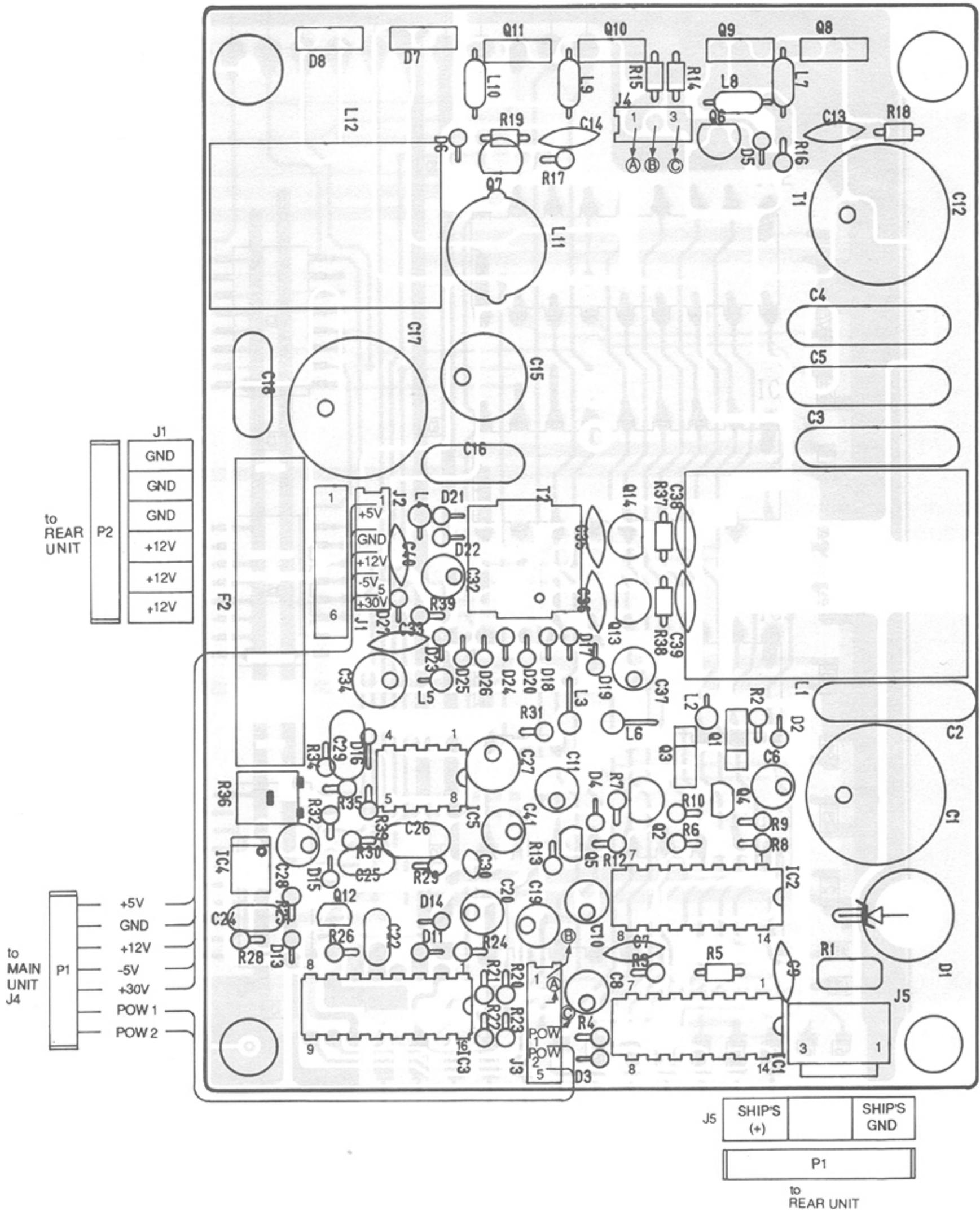
• MAIN UNIT



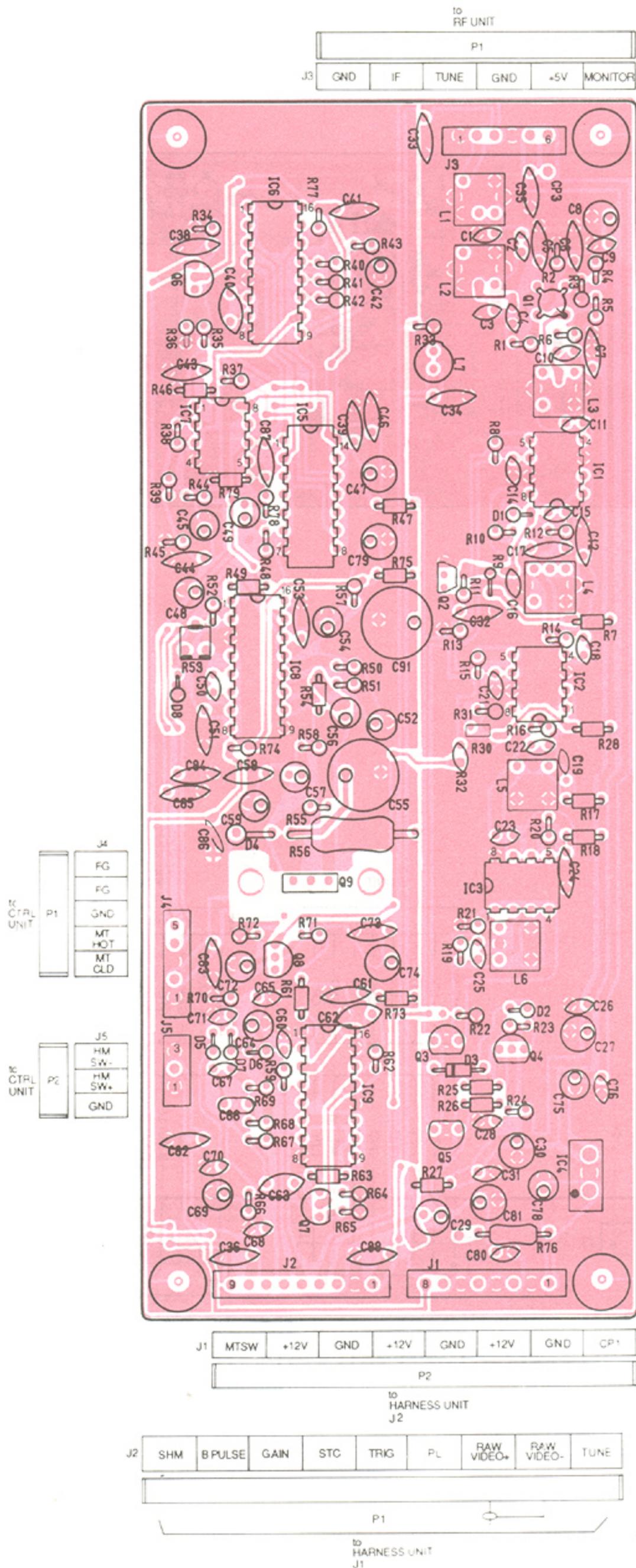
9-4 MAIN-A UNIT



9-5 REG UNIT

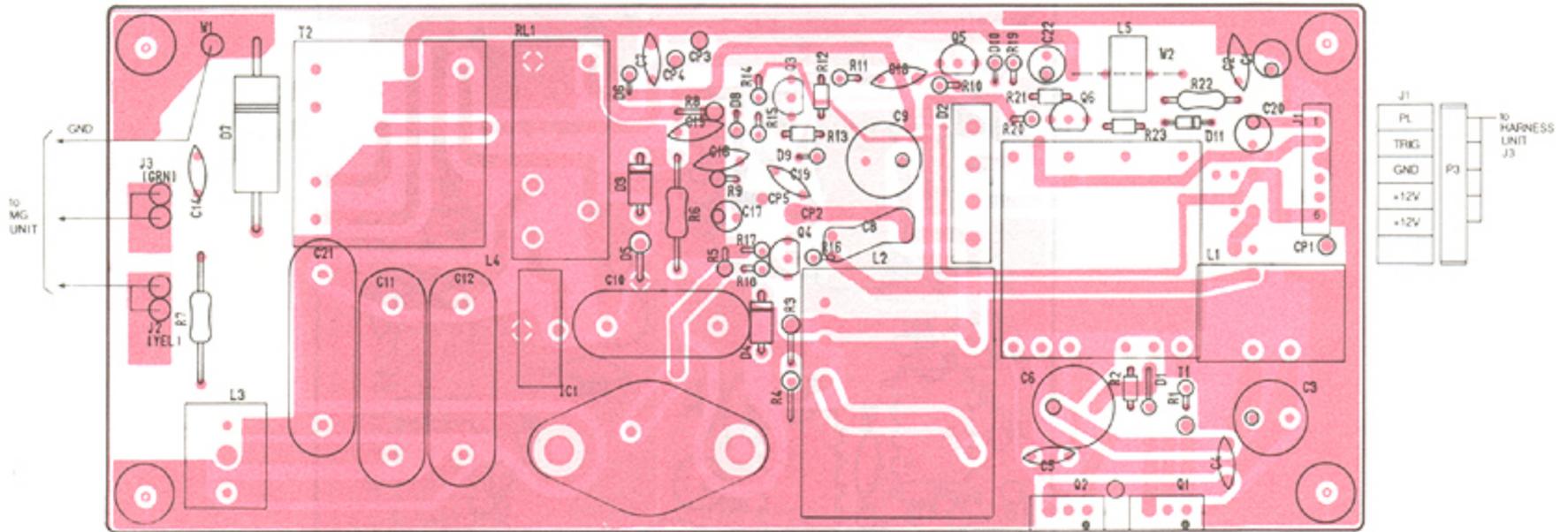


9-6 IF UNIT

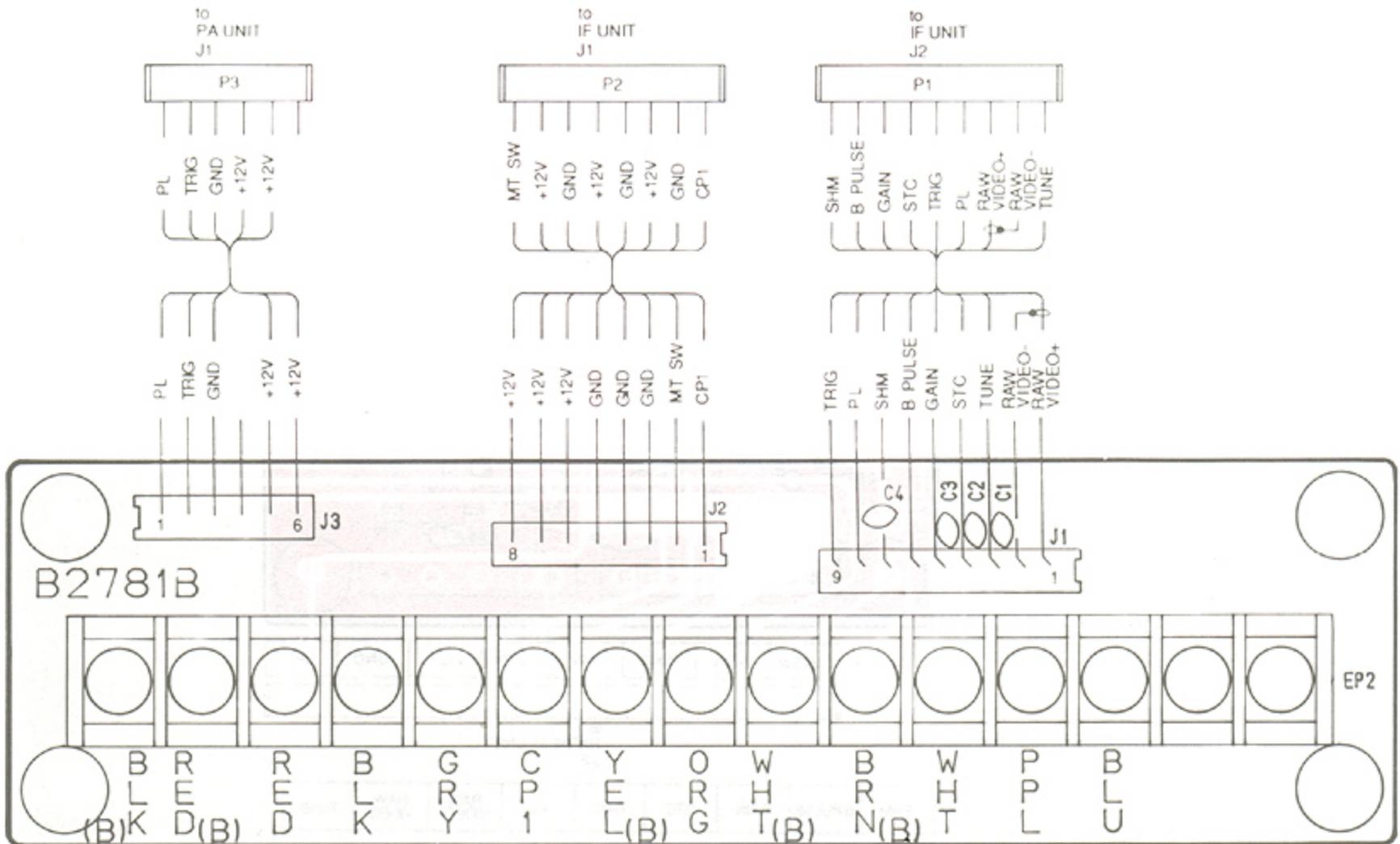


9-7 PA AND HARNESS UNITS

• PA UNIT



• HARNESS UNIT



SECTION 10 PARTS LIST

[ACC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
F1	5210000070	Fuse	FGB 10A
F2	5210000060	Fuse	FGB 5A
W1	8900002810	OPC-Cable	OPC-275
W2	8900002820	OPC-Cable	OPC-279

[VOL UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R1	7210001010	Variable	RK097111000AA
R2	7210001010	Variable	RK097111000AA
R3	7210001010	Variable	RK097111000AA
EP2	6910000640	Terminal	FSOH090RN
EP3	6910000640	Terminal	FSOH090RN

[SW UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1110001460	IC	μ PC1555C
Q1	1530000960	Transistor	2SC3399
D1	1710000160	Diode	1SS133
D2	1710000160	Diode	1SS133
D3	1710000160	Diode	1SS133
D4	1710000160	Diode	1SS133
R1	7010004190	Resistor	R20J 1k Ω
R2	7010004190	Resistor	R20J 1k Ω
R3	7010004190	Resistor	R20J 1k Ω
R4	7010004190	Resistor	R20J 1k Ω
R5	7010004190	Resistor	R20J 1k Ω
R6	7010004190	Resistor	R20J 1k Ω
R7	7010003400	Resistor	ELR20J 1k Ω
R8	7010003530	Resistor	ELR20J 10k Ω
R9	7010003550	Resistor	ELR20J 15k Ω
R10	7010003510	Resistor	ELR20J 6.8k Ω
C1	4310000020	Mylar	F2D 50V 103K
C2	4010000530	Ceramic	DD112 B 103K 50V
DS1	5040000820	LED	SLN-210MC
DS2	5040000820	LED	SLN-210MC
DS3	5040000820	LED	SLN-210MC
DS4	5040000820	LED	SLN-210MC
DS5	5040000820	LED	SLN-210MC
DS6	5040000820	LED	SLN-210MC
S1	2260000720	Switch	SKHKAA064A
S2	2260000720	Switch	SKHKAA064A
S3	2260000720	Switch	SKHKAA064A
S4	2260000720	Switch	SKHKAA064A
S5	2260000720	Switch	SKHKAA064A
S6	2260000720	Switch	SKHKAA064A
S7	2260000720	Switch	SKHKAA064A
S8	2260000720	Switch	SKHKAA064A
S9	2260000720	Switch	SKHKAA064A
S10	2260000720	Switch	SKHKAA064A
S11	2260000720	Switch	SKHKAA064A
S12	2260000720	Switch	SKHKAA064A
S13	2260000720	Switch	SKHKAA064A
S14	2260000720	Switch	SKHKAA064A

[SW UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
SP1	2520000060	Piezo buzzer	EFBRD24C01B
EP2	6910000640	Bead core	FSOH090RN
EP3	6910000640	Bead core	FSOH090RN
EP4	6910000640	Bead core	FSOH090RN
EP5	6910000640	Bead core	FSOH090RN

[SENSOR UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
S1	2260001230	Encoder	SW-111
J1	6510003390	Connector	B03B-EH-S
EP1	0910017691	P.C.Board	B 1696A FX-706

[REAR UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
S1	2260001280	Switch	AJ41100
F1	5220000140	Fuse Holder	FH-042
F2	5210000070	Fuse	FGB 10A
J1	6510007560	Connector	FM14-4S
J3	6510012160	Connector	FM214-8S
J4	6510011420	Connector	31-10
EP1	6910000640	Bead core	FSOH090RN
EP4	6910000640	Bead core	FSOH090RN

[REG UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1130001750	IC	TC4093BP
IC2	1130000050	IC	TC4013BP
IC3	1110001950	IC	μ PC494C
IC4	1170000180	Photo interrupter	PC817D
IC5	1110000070	IC	μ PC358C
Q1	1540000170	Transistor	2SD1226M R
Q2	1510000050	Transistor	2SA1015-Y
Q3	1520000080	Transistor	2SB909M R
Q4	1530002810	Transistor	2SC2785 FL
Q5	1530002810	Transistor	2SC2785 FL
Q6	1510000050	Transistor	2SA1015-Y
Q7	1510000050	Transistor	2SA1015-Y
Q8	1560000600	FET	2SK740
Q9	1560000600	FET	2SK740
Q10	1560000600	FET	2SK740
Q11	1560000600	FET	2SK740
Q12	1530000110	Transistor	2SC2458-GR
Q13	1530000410	Transistor	2SC1214C
Q14	1530000410	Transistor	2SC1214C
D1	1710000010	Diode	15CD11
D2	1730000500	Zener	RD13E B2
D3	1710000050	Diode	1SS53
D4	1730000500	Zener	RD13E B2
D5	1710000050	Diode	1SS53
D6	1710000050	Diode	1SS53

[REG UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
D7	1790000740	Diode	MA693
D8	1790000740	Diode	MA693
D11	1710000050	Diode	1SS53
D13	1710000050	Diode	1SS53
D14	1710000050	Diode	1SS53
D15	1710000040	Diode	1S953
D16	1730001780	Zener	RD6.2E B1
D17	1710000050	Diode	1SS53
D18	1710000050	Diode	1SS53
D19	1710000050	Diode	1SS53
D20	1710000050	Diode	1SS53
D21	1710000050	Diode	1SS53
D22	1710000050	Diode	1SS53
D23	1710000050	Diode	1SS53
D24	1710000050	Diode	1SS53
D25	1710000050	Diode	1SS53
D26	1710000050	Diode	1SS53
D27	1730000090	Zener	RD5.1E B1
L1	2040000310	Coil	AY25R3B
L2	6180000900	Coil	LAL 03NA 101K
L3	6180000990	Coil	LAL 04NA 101K
L4	6180000900	Coil	LAL 03NA 101K
L5	6180000900	Coil	LAL 03NA 101K
L6	6180000990	Coil	LAL 04NA 101K
L7	6910000670	Coil	BT01RN1-A61-001
L8	6910000670	Coil	BT01RN1-A61-001
L9	6910000670	Coil	BT01RN1-A61-001
L10	6910000670	Coil	BT01RN1-A61-001
L11	6170000150	Coil	LW-16
L12	6140000020	Coil	LR-93 SN12D 500
T1	5920000340	Transformer	TO-20
T2	5920000350	Transformer	TO-21
R1	7540000060	Surge Absorber	ERZC05DK560
R2	7010003530	Resistor	ELR20J 10k Ω
R3	7010003530	Resistor	ELR20J 10k Ω
R4	7010003660	Resistor	ELR20J 100k Ω
R5	7010004320	Resistor	R20J 10k Ω
R6	7010003620	Resistor	ELR20J 47k Ω
R7	7010003530	Resistor	ELR20J 10k Ω
R8	7010003490	Resistor	ELR20J 5.6k Ω
R9	7010003530	Resistor	ELR20J 10k Ω
R10	7010003490	Resistor	ELR20J 5.6k Ω
R12	7010003490	Resistor	ELR20J 5.6k Ω
R13	7010003530	Resistor	ELR20J 10k Ω
R14	7010004190	Resistor	R20J 1k Ω
R15	7010004190	Resistor	R20J 1k Ω
R16	7010003240	Resistor	ELR20J 47 Ω
R17	7010003240	Resistor	ELR20J 47 Ω
R18	7010003930	Resistor	R20J 6.8 Ω
R19	7010003930	Resistor	R20J 6.8 Ω
R20	7010003470	Resistor	ELR20J 3.9k Ω
R21	7010003490	Resistor	ELR20J 5.6k Ω
R22	7010003470	Resistor	ELR20J 3.9k Ω
R23	7010003440	Resistor	ELR20J 2.2k Ω
R24	7010003760	Resistor	ELR20J 680k Ω
R25	7010003530	Resistor	ELR20J 10k Ω
R26	7010003580	Resistor	ELR20J 22k Ω
R28	7010003440	Resistor	ELR20J 2.2k Ω
R29	7010003510	Resistor	ELR20J 6.8k Ω
R30	7010003470	Resistor	ELR20J 3.9k Ω
R31	7010003280	Resistor	ELR20J 100 Ω
R32	7010003440	Resistor	ELR20J 2.2k Ω
R33	7010003370	Resistor	ELR20J 560 Ω
R34	7010003410	Resistor	ELR20J 1.2k Ω
R35	7010003400	Resistor	ELR20J 1k Ω
R36	7310001070	Trimmer	RV-174 331
R37	7010004230	Resistor	R20J 2.2k Ω
R38	7010004230	Resistor	R20J 2.2k Ω
R39	7010003320	Resistor	ELR20J 220 Ω
C1	4510003030	Electrolytic	50 SS 1000 μ F
C2	4310000770	Metalized polyester	250 MMW 104K

[REG UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C3	4310000770	Metalized polyester	250 MMW 104K
C4	4310000770	Metalized polyester	250 MMW 104K
C5	4310000770	Metalized polyester	250 MMW 104K
C6	4510002810	Electrolytic	16 SS 47 μ F
C7	4040000260	Barrier Layer	UZE 08X 104M
C8	4510002780	Electrolytic	16 SS 10 μ F
C9	4010000530	Ceramic	DD112 B 103K 50V
C10	4510002780	Electrolytic	16 SS 10 μ F
C11	4510002810	Electrolytic	16 SS 47 μ F
C12	4510004300	Electrolytic	50 YXB 1000 μ F
C13	4010004470	Ceramic	DD12 B 472K 500V
C14	4010004470	Ceramic	DD12 B 472K 500V
C15	4510004290	Electrolytic	50 YXB 470 μ F
C16	4310000760	Metalized polyester	63 MMW 105K
C17	4510004300	Electrolytic	50 YXB 1000 μ F
C18	4310000760	Metalized polyester	63 MMW 105K
C19	4510002950	Electrolytic	50 SS 2R2 μ F
C20	4510002950	Electrolytic	50 SS 2R2 μ F
C22	4310000010	Mylar	F2D 50V 102K
C24	4310000010	Mylar	F2D 50V 102K
C25	4310000020	Mylar	F2D 50V 103K
C26	4310000230	Mylar	F2D 50V 683K
C27	4510003040	Electrolytic	16 SS 100 μ F
C28	4510002780	Electrolytic	16 SS 10 μ F
C29	4310000120	Mylar	F2D 50V 473K
C30	4010000500	Ceramic	DD104 B 102K 50V
C32	4510002810	Electrolytic	16 SS 47 μ F
C33	4010000530	Ceramic	DD112 B 103K 50V
C34	4510002950	Electrolytic	50 SS 2R2 μ F
C35	4010000520	Ceramic	DD108 B 472K 50V
C36	4010000520	Ceramic	DD108 B 472K 50V
C37	4510002810	Electrolytic	16 SS 47 μ F
C38	4010000410	Ceramic	DD107 SL 331J 50V
C39	4010000410	Ceramic	DD107 SL 331J 50V
C40	4010000530	Ceramic	DD112 B 103K 50V
C41	4510002810	Electrolytic	16 SS 47 μ F

F1	5210000060	Fuse	FGB 5A
F2	5220000020	Fuse Holder	S-N5051
J1	6510003420	Connector	B06B-EH-S
J5	6510011430	Connector	B3P-VH

[CTRL UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
S1	2260001300	Switch	FRS-1-NO-3P
MF1	2710000310	Motor	LC37GF-177VA

[PA UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1710000670	SCR	S6080B
Q1	1530002750	Transistor	2SC2334
Q2	1530002750	Transistor	2SC2334
Q3	1530002780	Transistor	2SC752(G)TM-Y
Q4	1530002780	Transistor	2SC752(G)TM-Y
Q5	1530000040	Transistor	2SC1815-Y
Q6	1530000040	Transistor	2SC1815-Y
D1	1710000040	Diode	1S953
D2	1790000200	Bridge rectifier	KBL06
D3	1790000730	Diode	F114E
D4	1790000730	Diode	F114E
D5	1790000760	Diode	RG-2A
D6	1710000040	Diode	1S953
D7	1790000750	Diode	HVR-1X-40B

[PA UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
D8	1710000040	Diode	1S953
D9	1710000040	Diode	1S953
D10	1730000400	Zener	RD5.6E B1
D11	1710000040	Diode	1S953
L1	6140000700	Coil	LR-92
L2	5920000320	Coil	TO-18
L3	6110002570	Coil	LA-216
L4	6140002080	Coil	LR-234
L5	6140000590	Coil	LR-81
RL1	6330000840	Relay	G2R-1 DC12V
T1	5920000310	Transformer	TO-17
T2	5920000330	Transformer	TO-19
R1	7010003160	Resistor	ELR20J 10 Ω
R2	7010003950	Resistor	R20J 10 Ω
R3	7010005290	Resistor	R50XJ 100k Ω
R4	7010005290	Resistor	R50XJ 100k Ω
R5	7010003240	Resistor	ELR20J 47 Ω
R6	7070000260	Resistor	CRH200 R-02J 22 Ω
R7	7070000630	Resistor	CRH200 R-02J 390 Ω
R8	7010005140	Resistor	R50XJ 1 Ω
R9	7010003670	Resistor	ELR20J 120k Ω
R10	7010003490	Resistor	ELR20J 5.6k Ω
R11	7010003280	Resistor	ELR20J 100 Ω
R12	7010004190	Resistor	R20J 1k Ω
R13	7010004110	Resistor	R20J 220 Ω
R14	7010003220	Resistor	ELR20J 33 Ω
R15	7010003440	Resistor	ELR20J 2.2k Ω
R16	7010003220	Resistor	ELR20J 33 Ω
R17	7010003280	Resistor	ELR20J 100 Ω
R18	7010003160	Resistor	ELR20J 10 Ω
R19	7010003530	Resistor	ELR20J 10k Ω
R20	7010003530	Resistor	ELR20J 10k Ω
R21	7010004070	Resistor	R20J 100 Ω
R22	7010001400	Resistor	R25XJ 100k Ω
R23	7010004020	Resistor	R20J 39 Ω
C1	4550000260	Tantalum	DN 1V 100M
C2	4010000530	Ceramic	DD112 B 103K 50V
C3	4510002820	Electrolytic	16 SS 1000 μ F
C4	4010000530	Ceramic	DD112 B 103K 50V
C5	4040000210	Barrier Layer	UAT 06X 153K
C6	4510002380	Electrolytic	16 SS 470 μ F
C7	4010000520	Ceramic	DD108 B 472K 50V
C8	4010004150	Ceramic	DD14 E 103P 500V
C9	4510004310	Electrolytic	450 TWS 10 μ F
C10	4310000720	Polypropylene	HAC2K 103K
C11	4310000810	Polypropylene	HAC2K 473K
C12	4310000810	Polypropylene	HAC2K 473K
C14	4010000520	Ceramic	DD108 B 472K 50V
C15	4040000250	Barrier Layer	UAT 08X 473M
C16	4040000260	Barrier Layer	UZE 08X 104M
C17	4510002980	Electrolytic	50 SS 10 μ F
C18	4040000230	Barrier Layer	UAT 06X 223M
C19	4010001040	Ceramic	DD112 CH 271J 50V
C20	4550000260	Tantalum	DN 1V 100M
C21	4310000800	Polypropylene	HAC2K 223K
C22	4510002940	Electrolytic	50 SS 1 μ F
W2	7120000380	Jumper	JPW 01 R-01
J1	6510003420	Connector	B06B-EH-S
J2	6510003100	Connector	RT01T-1.3B
J3	6510003100	Connector	RT01T-1.3B
J4	6510003100	Connector	RT01T-1.3B
CP1	6510003080	Check Point	RT01T-1.0B
CP2	6510003080	Check Point	RT01T-1.0B
CP3	6510003080	Check Point	RT01T-1.0B
CP4	6510003080	Check Point	RT01T-1.0B
CP5	6510003080	Check Point	RT01T-1.0B

[IF UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1110002290	IC	MC1353P
IC2	1110002290	IC	MC1350P
IC3	1110002300	IC	MC1330AP
IC4	1180000190	IC	NJM7805A
IC5	1130001510	IC	TC4024BP
IC6	1130005010	IC	HD14046BP
IC7	1110001070	IC	μ PC393C
IC8	1120001740	IC	LB1609
IC9	1130000230	IC	TC4528BP
Q1	1580000240	FET	3SK122 M
Q2	1530000960	Transistor	2SC3399
Q3	1510000050	Transistor	2SA1015-Y
Q4	1530000040	Transistor	2SC1815-Y
Q5	1510000050	Transistor	2SA1015-Y
Q6	1530000040	Transistor	2SC1815-Y
Q7	1530000040	Transistor	2SC1815-Y
Q8	1530000040	Transistor	2SC1815-Y
Q9	1520000020	Transistor	2SB596-O
D1	1710000050	Diode	1S553
D2	1710000040	Diode	1S953
D3	1710000040	Diode	1S953
D4	1710000350	Diode	1N4002
D5	1710000040	Diode	1S953
D6	1710000040	Diode	1S953
D7	1710000040	Diode	1S953
D8	1730000070	Zener	RD3.9E B2
L1	6150002430	Coil	LS-254
L2	6150002430	Coil	LS-254
L3	6150000990	Coil	LS-114
L4	6150001130	Coil	LS-127
L5	6130001830	Coil	LB-184
L6	6130001830	Coil	LB-184
L7	6180000370	Coil	RFC L4 100J
R1	7010003470	Resistor	ELR20J 3.9k Ω
R2	7010003280	Resistor	ELR20J 100 Ω
R3	7010003720	Resistor	ELR20J 330k Ω
R4	7010003740	Resistor	ELR20J 470k Ω
R5	7010003280	Resistor	ELR20J 100 Ω
R6	7010003420	Resistor	ELR20J 1.5k Ω
R7	7010003950	Resistor	R20J 10 Ω
R8	7010003490	Resistor	ELR20J 5.6k Ω
R9	7010003620	Resistor	ELR20J 47k Ω
R10	7010003280	Resistor	ELR20J 100 Ω
R11	7010003400	Resistor	ELR20J 1k Ω
R12	7010003440	Resistor	ELR20J 2.2k Ω
R13	7010003370	Resistor	ELR20J 560 Ω
R14	7010003200	Resistor	ELR20J 22 Ω
R15	7010003530	Resistor	ELR20J 10k Ω
R16	7010003300	Resistor	ELR20J 150 Ω
R17	7010003950	Resistor	R20J 10 Ω
R18	7010003950	Resistor	R20J 10 Ω
R19	7010003320	Resistor	ELR20J 220 Ω
R20	7010003460	Resistor	ELR20J 3.3k Ω
R21	7010003470	Resistor	ELR20J 3.9k Ω
R22	7010003470	Resistor	ELR20J 3.9k Ω
R23	7010003400	Resistor	ELR20J 1k Ω
R24	7010003160	Resistor	ELR20J 10 Ω
R25	7010003990	Resistor	R20J 22 Ω
R26	7010004230	Resistor	R20J 2.2k Ω
R27	7010003950	Resistor	R20J 10 Ω
R28	7010004260	Resistor	R20J 3.9k Ω
R30	7510000360	Thermistor	ERT-D2FGL171S
R31	7010003440	Resistor	ELR20J 2.2k Ω
R32	7010003400	Resistor	ELR20J 1k Ω
R33	7010003660	Resistor	ELR20J 100k Ω
R34	7010003430	Resistor	ELR20J 1.8k Ω
R35	7010003490	Resistor	ELR20J 5.6k Ω
R36	7010003540	Resistor	ELR20J 12k Ω
R37	7010003480	Resistor	ELR20J 4.7k Ω
R38	7010003780	Resistor	ELR20J 1M Ω
R39	7010003530	Resistor	ELR20J 10k Ω

[IF UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R40	7010003530	Resistor	ELR20J 10kΩ
R41	7010003780	Resistor	ELR20J 1MΩ
R42	7010003620	Resistor	ELR20J 47kΩ
R43	7010003400	Resistor	ELR20J 1kΩ
R44	7010003470	Resistor	ELR20J 3.9kΩ
R45	7010003320	Resistor	ELR20J 220Ω
R46	7010004420	Resistor	R20J 56kΩ
R47	7010003950	Resistor	R20J 10Ω
R48	7010003280	Resistor	ELR20J 100Ω
R49	7010004450	Resistor	R20J 100kΩ
R50	7010003660	Resistor	ELR20J 100kΩ
R51	7010003620	Resistor	ELR20J 47kΩ
R52	7010003580	Resistor	ELR20J 22kΩ
R53	7310001840	Trimmer	RH0421CS3J08A
R54	7010004180	Resistor	R20J 820Ω
R55	7010003530	Resistor	ELR20J 10kΩ
R56	7070000250	Resistor	CRH200 R-02J 4.7Ω
R57	7010003280	Resistor	ELR20J 100Ω
R58	7010003530	Resistor	ELR20J 10kΩ
R59	7010003530	Resistor	ELR20J 10kΩ
R61	7010004280	Resistor	R20J 5.6kΩ
R62	7010003650	Resistor	ELR20J 82kΩ
R63	7010004280	Resistor	R20J 5.6kΩ
R64	7010003530	Resistor	ELR20J 10kΩ
R65	7010003400	Resistor	ELR20J 1kΩ
R66	7010003280	Resistor	ELR20J 100Ω
R67	7010003490	Resistor	ELR20J 5.6kΩ
R68	7010003460	Resistor	ELR20J 3.3kΩ
R69	7010003660	Resistor	ELR20J 100kΩ
R70	7010003660	Resistor	ELR20J 100kΩ
R71	7010003280	Resistor	ELR20J 100Ω
R72	7010003360	Resistor	ELR20J 470Ω
R73	7010003950	Resistor	R20J 10Ω
R74	7010003400	Resistor	ELR20J 1kΩ
R75	7010003950	Resistor	R20J 10Ω
R76	7010004680	Resistor	R50XJ 33Ω
R77	7010003530	Resistor	ELR20J 10kΩ
R78	7010003400	Resistor	ELR20J 1kΩ
R79	7010004320	Resistor	R20J 10kΩ
C1	4010000670	Ceramic	DD104 CH 070D 50V
C2	4010000040	Ceramic	DD104 SL 020C 50V
C3	4010000630	Ceramic	DD104 C.J 030C 50V
C4	4010000500	Ceramic	DD104 B 102K 50V
C5	4010000530	Ceramic	DD112 B 103K 50V
C6	4010000530	Ceramic	DD112 B 103K 50V
C7	4010000530	Ceramic	DD112 B 103K 50V
C8	4510002800	Electrolytic	16 SS 33μF
C9	4010000500	Ceramic	DD104 B 102K 50V
C10	4010000660	Ceramic	DD104 CH 060D 50V
C11	4010000500	Ceramic	DD104 B 102K 50V
C12	4010000530	Ceramic	DD112 B 103K 50V
C14	4010000500	Ceramic	DD104 B 102K 50V
C15	4010000500	Ceramic	DD104 B 102K 50V
C16	4010000500	Ceramic	DD104 B 102K 50V
C17	4010000870	Ceramic	DD106 CH 510J 50V
C18	4010000160	Ceramic	DD104 SL 180J 50V
C19	4010000530	Ceramic	DD112 B 103K 50V
C21	4010000500	Ceramic	DD104 B 102K 50V
C22	4010000720	Ceramic	DD104 CH 120J 50V
C23	4010000500	Ceramic	DD104 B 102K 50V
C24	4010000530	Ceramic	DD112 B 103K 50V
C25	4010000700	Ceramic	DD104 CH 100D 50V
C26	4010000500	Ceramic	DD104 B 102K 50V
C27	4510002800	Electrolytic	16 SS 33μF
C28	4010000500	Ceramic	DD104 B 102K 50V
C29	4510003040	Electrolytic	16 SS 100μF
C30	4510003040	Electrolytic	16 SS 100μF
C31	4010000500	Ceramic	DD104 B 102K 50V
C32	4010000530	Ceramic	DD112 B 103K 50V
C33	4010000530	Ceramic	DD112 B 103K 50V
C34	4010000530	Ceramic	DD112 B 103K 50V
C35	4010000530	Ceramic	DD112 B 103K 50V
C36	4010000530	Ceramic	DD112 B 103K 50V
C38	4010000530	Ceramic	DD112 B 103K 50V

[IF UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C39	4040000260	Barrier Layer	UZE 08X 104M
C40	4310000020	Mylar	F2D 50V 103K
C41	4040000260	Barrier Layer	UZE 08X 104M
C42	4510002810	Electrolytic	16 SS 47μF
C43	4040000260	Barrier Layer	UZE 08X 104M
C44	4040000260	Barrier Layer	UZE 08X 104M
C45	4510002940	Electrolytic	50 SS 1μF
C46	4040000260	Barrier Layer	UZE 08X 104M
C47	4510003040	Electrolytic	16 SS 100μF
C48	4510002790	Electrolytic	16 SS 22μF
C49	4510002790	Electrolytic	16 SS 22μF
C50	4010000500	Ceramic	DD104 B 102K 50V
C51	4310000030	Mylar	F2D 50V 104K
C52	4510001970	Electrolytic	50 MS7 0R1μF
C53	4040000260	Barrier Layer	UZE 08X 104M
C54	4510002780	Electrolytic	16 SS 10μF
C55	4510002380	Electrolytic	16 SS 470μF
C56	4510002830	Electrolytic	25 SS 4R7μF
C57	4510002940	Electrolytic	50 SS 1μF
C58	4040000250	Barrier Layer	UAT 08X 473M
C59	4510002980	Electrolytic	50 SS 10μF
C60	4010000780	Ceramic	DD104 CH 220J 50V
C61	4040000260	Barrier Layer	UZE 08X 104M
C62	4310000010	Mylar	F2D 50V 102K
C63	4310000060	Mylar	F2D 50V 223K
C64	4510002780	Electrolytic	16 SS 10μF
C65	4010000500	Ceramic	DD104 B 102K 50V
C66	4310000090	Mylar	F2D 50V 333K
C67	4040000190	Barrier Layer	UAT 05X 103K
C68	4010000500	Ceramic	DD104 B 102K 50V
C69	4510002940	Electrolytic	50 SS 1μF
C70	4010000500	Ceramic	DD104 B 102K 50V
C71	4010000330	Ceramic	DD105 SL 101J 50V
C72	4510002780	Electrolytic	16 SS 10μF
C73	4040000260	Barrier Layer	UZE 08X 104M
C74	4510003040	Electrolytic	16 SS 100μF
C75	4510002780	Electrolytic	16 SS 10μF
C76	4010000500	Ceramic	DD104 B 102K 50V
C78	4510002780	Electrolytic	16 SS 10μF
C79	4510003040	Electrolytic	16 SS 100μF
C80	4010000500	Ceramic	DD104 B 102K 50V
C81	4510002780	Electrolytic	16 SS 10μF
C82	4010000530	Ceramic	DD112 B 103K 50V
C83	4010000530	Ceramic	DD112 B 103K 50V
C84	4010000530	Ceramic	DD112 B 103K 50V
C85	4010000530	Ceramic	DD112 B 103K 50V
C86	4010000530	Ceramic	DD112 B 103K 50V
C87	4010000530	Ceramic	DD112 B 103K 50V
C88	4010000530	Ceramic	DD112 B 103K 50V
C91	4510002820	Electrolytic	16 SS 1000μF
J1	6510003440	Connector	B08B-EH-S
J2	6510003450	Connector	B09B-EH-S
J3	6510003420	Connector	B06B-EH-S
J4	6510003410	Connector	B05B-EH-S
J5	6510003410	Connector	B05B-EH-S
CP3	6510003080	Check Point	RT01T-1.0B

[RF UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
EP1	6910004880	Magnetron	MSF1421B
EP2	6910004870	Front End	NJT1946
EP3	6910004860	Circulator	NJC3901D
EP4	6910004850	Limitter	NJS6930

[HARNES UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C1	4010000500	Ceramic	DD104 B 102K 50V
C2	4010000500	Ceramic	DD104 B 102K 50V
C3	4010000500	Ceramic	DD104 B 102K 50V
C4	4010000500	Ceramic	DD104 B 102K 50V
EP2	6910004890	Terminal	SX-003(A)15P

[DISP-A UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
DS1	5070000030	CRT	ME-9813-IC

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1130005480	IC	TC74HC573AF
IC2	1130005400	IC	TC74HC166AF
IC3	1130005400	IC	TC74HC166AF
IC4	1130004920	IC	TC74HC04AF
IC5	1130005600	IC	TC74HC4075AF
IC6	1130005250	IC	TC74HC08AF
IC7	1130005260	IC	TC74HC09AF
IC8	1130005270	IC	TC74HC10AF
IC9	1130005420	IC	TC74HC175AF
IC10	1130005040	IC	HM50464RP12ML
IC12	1130005250	IC	TC74HC08AF
IC13	1130004840	IC	TC74HC74AF
IC14	1130005340	IC	TC74HC139AF
IC15	1130005310	IC	TC74HC32AF
IC16	1130005240	IC	TC74HC00AF
IC17	1140001220	IC	HD64180R1P6
IC18	1140000940	IC	TMP82C255AN-2-Z
IC19	1130005510	IC	μPD72020C-8
IC21	1130005630	IC	SC-1155
IC22	1130005390	IC	TC74HC163AF
IC23	1130005480	IC	TC74HC573AF
IC24	1130005480	IC	TC74HC573AF
IC25	1130005440	IC	TC74HC245AF
IC26	1130005420	IC	TC74HC175AF
IC27	1130005400	IC	TC74HC166AF
IC29	1130004850	IC	TC74HC4040AF
IC30	1130005550	IC	μPD74HC123AGS
IC31	1130005420	IC	TC74HC175AF
IC32	1130005310	IC	TC74HC32AF
IC33	1110001550	IC	S-8054ALB-LM-T1
IC34	1110002380	IC	TA7366P
IC35	1130004110	IC	μPD74HC244GS-T1
IC36	1130005040	IC	HM50464RP12ML
IC37	1130005040	IC	HM50464RP12ML
IC38	1130005040	IC	HM50464RP12ML
IC39	1130005040	IC	HM50464RP12ML
IC40	1130004840	IC	TC74HC74AF
IC41	1130004850	IC	TC74HC4040AF
IC42	1170000170	IC	TLP521-1
IC43	1130005230	IC	TC74HCU04AF
IC44	1130005290	IC	TC74HC14AF
IC45	1130005230	IC	TC74HCU04AF
IC46	1110002340	IC	LM360N
IC47	1130003920	IC	TC4S69F
IC48	1130005480	IC	TC74HC573AF
IC49	1130005590	IC	TC74HC86AF
IC50	1130004760	IC	S-2940IF-T1
Q1	1530000160	Transistor	2SC2712-Y
Q2	1530000160	Transistor	2SC2712-Y
Q3	1530000160	Transistor	2SC2712-Y
Q4	1530000160	Transistor	2SC2712-Y
Q5	1530000160	Transistor	2SC2712-Y
Q6	1530002790	Transistor	2SC2859-Y

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
Q7	1530002800	Transistor	2SC2873-Y
Q8	1590000420	Transistor	RN1404
Q9	1560000410	FET	2SK209-BL
Q10	1510000110	Transistor	2SA1162-Y
Q11	1530000160	Transistor	2SC2712-Y
D1	1750000060	Diode	1SS196
D2	1750000060	Diode	1SS196
D3	1750000060	Diode	1SS196
D4	1750000060	Diode	1SS196
D5	1750000060	Diode	1SS196
D6	1750000060	Diode	1SS196
D7	1750000060	Diode	1SS196
D8	1750000060	Diode	1SS196
RL1	6330000180	Relay	MZ-12HG
RL2	6330000180	Relay	MZ-12HG
X1	6060000430	Ceralock	CSA24.00MX040
X2	6050005760	Crystal	CR-276
R1	7030000350	Resistor	MCR10EZHZJ 560Ω
R2	7030000140	Resistor	MCR10EZHZJ 10Ω
R3	7030000700	Resistor	MCR10EZHZJ 470kΩ
R4	7030000460	Resistor	MCR10EZHZJ 4.7kΩ
R5	7030000400	Resistor	MCR10EZHZJ 1.5kΩ
R6	7030000580	Resistor	MCR10EZHZJ 47kΩ
R7	7030000350	Resistor	MCR10EZHZJ 560Ω
R8	7030000460	Resistor	MCR10EZHZJ 4.7kΩ
R9	7030000380	Resistor	MCR10EZHZJ 1kΩ
R10	7030000620	Resistor	MCR10EZHZJ 100kΩ
R11	7030000520	Resistor	MCR10EZHZJ 15kΩ
R12	7030000620	Resistor	MCR10EZHZJ 100kΩ
R13	7030000620	Resistor	MCR10EZHZJ 100kΩ
R14	7030000500	Resistor	MCR10EZHZJ 10kΩ
R15	7030000220	Resistor	MCR10EZHZJ 47Ω
R16	7030000220	Resistor	MCR10EZHZJ 47Ω
R17	7030000220	Resistor	MCR10EZHZJ 47Ω
R18	7030000220	Resistor	MCR10EZHZJ 47Ω
R19	7030000360	Resistor	MCR10EZHZJ 680Ω
R20	7030000410	Resistor	MCR10EZHZJ 1.8kΩ
R21	7310000710	Trimmer	RH0651C13J1YA
R22	7030000440	Resistor	MCR10EZHZJ 3.3kΩ
R23	7030000400	Resistor	MCR10EZHZJ 1.5kΩ
R24	7030000540	Resistor	MCR10EZHZJ 22kΩ
R25	7410000140	Array	RMX-6 472K
R26	7030000500	Resistor	MCR10EZHZJ 10kΩ
R27	7030000500	Resistor	MCR10EZHZJ 10kΩ
R28	7030000720	Resistor	MCR10EZHZJ 680kΩ
R29	7310000790	Trimmer	RH0651C15J1UA
R30	7030000220	Resistor	MCR10EZHZJ 47Ω
R31	7030000220	Resistor	MCR10EZHZJ 47Ω
R32	7030000180	Resistor	MCR10EZHZJ 22Ω
R33	7030000180	Resistor	MCR10EZHZJ 22Ω
R34	7030000180	Resistor	MCR10EZHZJ 22Ω
R35	7030000180	Resistor	MCR10EZHZJ 22Ω
R36	7030000580	Resistor	MCR10EZHZJ 47kΩ
R37	7030000580	Resistor	MCR10EZHZJ 47kΩ
R38	7030000580	Resistor	MCR10EZHZJ 47kΩ
R39	7030000580	Resistor	MCR10EZHZJ 47kΩ
R40	7030000580	Resistor	MCR10EZHZJ 47kΩ
R41	7030000580	Resistor	MCR10EZHZJ 47kΩ
R42	7030000580	Resistor	MCR10EZHZJ 47kΩ
R43	7030000580	Resistor	MCR10EZHZJ 47kΩ
R44	7410000070	Array	RMX-4 472K
R45	7030000440	Resistor	MCR10EZHZJ 3.3kΩ
R46	7030000260	Resistor	MCR10EZHZJ 100Ω
R47	7030000640	Resistor	MCR10EZHZJ 150kΩ
R48	7030000340	Resistor	MCR10EZHZJ 470Ω
R49	7030000380	Resistor	MCR10EZHZJ 1kΩ
R50	7030000440	Resistor	MCR10EZHZJ 3.3kΩ
R51	7030000440	Resistor	MCR10EZHZJ 3.3kΩ
R52	7030000620	Resistor	MCR10EZHZJ 100kΩ
R53	7030000180	Resistor	MCR10EZHZJ 22Ω
R54	7030000180	Resistor	MCR10EZHZJ 22Ω

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R55	7030000180	Resistor	MCR10EZHZ 22Ω
R56	7030000180	Resistor	MCR10EZHZ 22Ω
R57	7030000180	Resistor	MCR10EZHZ 22Ω
R58	7030000180	Resistor	MCR10EZHZ 22Ω
R59	7030000180	Resistor	MCR10EZHZ 22Ω
R60	7030000180	Resistor	MCR10EZHZ 22Ω
R61	7030000220	Resistor	MCR10EZHZ 47Ω
R62	7030000220	Resistor	MCR10EZHZ 47Ω
R63	7030000220	Resistor	MCR10EZHZ 47Ω
R64	7030000220	Resistor	MCR10EZHZ 47Ω
R65	7030000220	Resistor	MCR10EZHZ 47Ω
R66	7030000220	Resistor	MCR10EZHZ 47Ω
R67	7030000220	Resistor	MCR10EZHZ 47Ω
R68	7030000460	Resistor	MCR10EZHZ 4.7kΩ
R69	7310000750	Trimmer	RH0651C14J2WA
R70	7030000550	Resistor	MCR10EZHZ 27kΩ
R71	7310000750	Trimmer	RH0651C14J2WA
R72	7030000400	Resistor	MCR10EZHZ 1.5kΩ
R73	7030000430	Resistor	MCR10EZHZ 2.7kΩ
R74	7310000760	Trimmer	RH0651C4J401A
R75	7030000160	Resistor	MCR10EZHZ 15Ω
R76	7030000100	Resistor	MCR10EZHZ 4.7Ω
R77	7030000500	Resistor	MCR10EZHZ 10kΩ
R78	7030000380	Resistor	MCR10EZHZ 1kΩ
R79	7030000400	Resistor	MCR10EZHZ 1.5kΩ
R80	7030000220	Resistor	MCR10EZHZ 47Ω
R81	7030000380	Resistor	MCR10EZHZ 1kΩ
R82	7030000580	Resistor	MCR10EZHZ 47kΩ
R83	7310000750	Trimmer	RH0651C14J2WA
R84	7030000500	Resistor	MCR10EZHZ 10kΩ
R85	7030000580	Resistor	MCR10EZHZ 47kΩ
R86	7030000430	Resistor	MCR10EZHZ 2.7kΩ
R87	7030000260	Resistor	MCR10EZHZ 100Ω
R88	7030000540	Resistor	MCR10EZHZ 22kΩ
R89	7030000460	Resistor	MCR10EZHZ 4.7kΩ
R90	7030000650	Resistor	MCR10EZHZ 180kΩ
R91	7030000740	Resistor	MCR10EZHZ 1MΩ
C1	4030004520	Ceramic	C2012 SL 1H 220J-T-A
C2	4030004500	Ceramic	C2012 SL 1H 180J-T-A
C3	4030004500	Ceramic	C2012 SL 1H 180J-T-A
C4	4030004500	Ceramic	C2012 SL 1H 180J-T-A
C5	4030004500	Ceramic	C2012 SL 1H 180J-T-A
C6	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C7	4510002810	Electrolytic	16 SS 47μF
C8	4510002790	Electrolytic	16 SS 22μF
C9	4510002830	Electrolytic	25 SS 4R7μF
C10	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C11	4030004740	Ceramic	C2012 JB 1H 472K-T-A
C12	4030004740	Ceramic	C2012 JB 1H 472K-T-A
C13	4510002810	Electrolytic	16 SS 47μF
C16	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C17	4510002780	Electrolytic	16 SS 10μF
C18	4310000010	Mylar	F2D 50V 102K
C19	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C20	4510002810	Electrolytic	16 SS 47μF
C21	4510002810	Electrolytic	16 SS 47μF
C22	4510002380	Electrolytic	16 SS 470μF
C23	4510002380	Electrolytic	16 SS 470μF
C24	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C25	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C26	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C27	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C28	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C29	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C30	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C31	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C32	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C33	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C34	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C35	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C36	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C37	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C38	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C39	4030006450	Ceramic	C2012 JF 1H 103Z-T-A

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C40	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C41	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C42	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C43	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C44	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C45	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C46	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C47	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C48	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C49	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C50	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C51	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C52	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C53	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C54	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C55	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C56	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C57	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C58	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C59	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C60	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C61	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C62	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C63	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C64	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C65	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C66	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C67	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C68	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C69	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C70	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C71	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C72	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C73	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C74	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C75	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C76	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C77	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C78	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C79	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C80	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C81	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C82	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C83	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C84	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C85	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C86	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C87	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C88	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C89	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C90	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C91	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C92	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C93	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C94	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C95	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C96	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C97	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
J1	6510003470	Connector	B11B-EH-S
J2	6510003450	Connector	B09B-EH-S
J3	6510003460	Connector	B10B-EH-S
J4	6510003430	Connector	B07B-EH-S
J5	6510003420	Connector	B06B-EH-S
J6	6510003460	Connector	B10B-EH-S
J7	6510003450	Connector	B09B-EH-S
J8	6510012190	Connector	XC5E-5021
J9	6510010290	Connector	SB14P-HVQ-CA
J10	6510010280	Connector	SB13P-HVQ-CA
J12	2610000200	Crystal Socket	ICC05-028 360T
IC1	1130004110	IC	μPD74HC244GS-T1
IC2	1130005040	IC	HM50464RP12ML
IC3	1130005040	IC	HM50464RP12ML
IC4	1130005040	IC	HM50464RP12ML

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	REF. NO.	ORDER NO.	DESCRIPTION
IC5	1130005040	IC	HM50464RP12ML		
IC6	1130005400	IC	TC74HC166AF		
IC7	1130005400	IC	TC74HC166AF		
R1	7030000140	Resistor	MCR10EZHZ 10Ω		
R2	7030000140	Resistor	MCR10EZHZ 10Ω		
R3	7030000180	Resistor	MCR10EZHZ 22Ω		
R4	7030000180	Resistor	MCR10EZHZ 22Ω		
R5	7030000180	Resistor	MCR10EZHZ 22Ω		
R6	7030000180	Resistor	MCR10EZHZ 22Ω		
R7	7030000180	Resistor	MCR10EZHZ 22Ω		
R8	7030000180	Resistor	MCR10EZHZ 22Ω		
R9	7030000180	Resistor	MCR10EZHZ 22Ω		
R10	7030000180	Resistor	MCR10EZHZ 22Ω		
R11	7030000180	Resistor	MCR10EZHZ 22Ω		
R12	7030000180	Resistor	MCR10EZHZ 22Ω		
R13	7030000180	Resistor	MCR10EZHZ 22Ω		
R15	7030000180	Resistor	MCR10EZHZ 22Ω		
R16	7030000580	Resistor	MCR10EZHZ 47kΩ		
R17	7030000580	Resistor	MCR10EZHZ 47kΩ		
R18	7030000580	Resistor	MCR10EZHZ 47kΩ		
R19	7030000580	Resistor	MCR10EZHZ 47kΩ		
R20	7030000580	Resistor	MCR10EZHZ 47kΩ		
R21	7030000580	Resistor	MCR10EZHZ 47kΩ		
R22	7030000580	Resistor	MCR10EZHZ 47kΩ		
R23	7030000580	Resistor	MCR10EZHZ 47kΩ		
C1	4030006450	Ceramic	C2012 JF 1H 103Z-T-A		
C2	4030006450	Ceramic	C2012 JF 1H 103Z-T-A		
C3	4030006450	Ceramic	C2012 JF 1H 103Z-T-A		
C4	4030006450	Ceramic	C2012 JF 1H 103Z-T-A		
C5	4030006450	Ceramic	C2012 JF 1H 103Z-T-A		
C6	4030006450	Ceramic	C2012 JF 1H 103Z-T-A		
C7	4030006450	Ceramic	C2012 JF 1H 103Z-T-A		
C8	4030006450	Ceramic	C2012 JF 1H 103Z-T-A		
C9	4030006450	Ceramic	C2012 JF 1H 103Z-T-A		
C10	4030006450	Ceramic	C2012 JF 1H 103Z-T-A		
C11	4030006450	Ceramic	C2012 JF 1H 103Z-T-A		

[LOGIC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	REF. NO.	ORDER NO.	DESCRIPTION
IC1	1130005550	IC	μPD74HC123AGS		
IC2	1130004840	IC	TC74HC74AF		
IC3	1140000990	IC	HD647180X0FS6		
IC4	1130005430	IC	TC74HC191AF		
IC5	1130004850	IC	TC74HC4040AF		
IC6	1130004840	IC	TC74HC74AF		
IC7	1130004840	IC	TC74HC74AF		
IC8	1130005460	IC	TC74HC283AF		
IC9	1130005460	IC	TC74HC283AF		
IC10	1130005450	IC	TC74HC273AF		
IC11	1130005460	IC	TC74HC283AF		
IC12	1130005460	IC	TC74HC283AF		
IC13	1130005450	IC	TC74HC273AF		
IC14	1130005430	IC	TC74HC191AF		
IC15	1130005430	IC	TC74HC191AF		
IC16	1130005430	IC	TC74HC191AF		
IC17	1130005430	IC	TC74HC191AF		
IC18	1130005430	IC	TC74HC191AF		
IC19	1130005430	IC	TC74HC191AF		
IC20	1130005480	IC	TC74HC573AF		
IC21	1130005480	IC	TC74HC573AF		
IC22	1130005340	IC	TC74HC139AF		
IC23	1130004850	IC	TC74HC4040AF		
IC24	1130005370	IC	TC74HC157AF		
IC25	1130004920	IC	TC74HC04AF		
IC26	1130005250	IC	TC74HC08AF		
IC27	1130005240	IC	TC74HC00AF		
IC28	1130005250	IC	TC74HC08AF		
IC29	1130005250	IC	TC74HC08AF		
IC30	1130005300	IC	TC74HC27AF		

[LOGIC UNIT]

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IC31	1130005310	IC	TC74HC32AF		
IC32	1130004920	IC	TC74HC04AF		
IC33	1130004840	IC	TC74HC74AF		
IC34	1130005290	IC	TC74HC14AF		
IC35	1130005480	IC	TC74HC573AF		
IC36	1130005480	IC	TC74HC573AF		
IC42	1130005410	IC	TC74HC174AF		
IC43	1130005410	IC	TC74HC174AF		
IC44	1130004840	IC	TC74HC74AF		
IC45	1130004840	IC	TC74HC74AF		
IC46	1130005330	IC	TC74HC125AF		
IC47	1130005360	IC	TC74HC153AF		
IC48	1130005380	IC	TC74HC161AF		
IC49	1130005370	IC	TC74HC157AF		
IC50	1130005430	IC	TC74HC191AF		
IC51	1130005360	IC	TC74HC153AF		
IC52	1130005470	IC	TC74HC393AF		
IC53	1130005370	IC	TC74HC157AF		
IC54	1130004011	IC	TC74HC138AF		
IC55	1130005350	IC	TC74HC148AF		
IC56	1130005230	IC	TC74HC04AF		
IC57	1130005290	IC	TC74HC14AF		
IC58	1130005250	IC	TC74HC08AF		
IC59	1130005380	IC	TC74HC161AF		
IC60	1130005380	IC	TC74HC161AF		
IC61	1130004920	IC	TC74HC04AF		
IC62	1130005490	IC	TC74HC4094AF		
IC63	1130005490	IC	TC74HC4094AF		
IC64	1130005380	IC	TC74HC161AF		
IC65	1130005470	IC	TC74HC393AF		
IC66	1130004840	IC	TC74HC74AF		
IC67	1130005550	IC	μPD74HC123AGS		
IC68	1130005280	IC	TC74HC11AF		
IC69	1130005380	IC	TC74HC161AF		
IC70	1130005380	IC	TC74HC161AF		
IC71	1130005380	IC	TC74HC161AF		
IC72	1130004840	IC	TC74HC74AF		
IC73	1130005310	IC	TC74HC32AF		
IC74	1130005310	IC	TC74HC32AF		
IC75	1130005300	IC	TC74HC27AF		
IC76	1130005240	IC	TC74HC00AF		
IC77	1130005500	IC	HM6288JP-25D		
IC78	1130005270	IC	TC74HC10AF		
D1	1730000680	Zener	RD4.7M-T2B2		
D2	1750000060	Diode	1SS196		
D3	1750000060	Diode	1SS196		
L1	6200001220	Coil	MLF2012D R82M-T		
X1	6050007030	Crystal	RF-4A3 FAR NKD-		
R1	7030000580	Resistor	MCR10EZHZ 47kΩ		
R2	7030000380	Resistor	MCR10EZHZ 1kΩ		
R3	7310002300	Trimmer	RH04A1A12X 100Ω		
R4	7030000220	Resistor	MCR10EZHZ 47Ω		
R5	7030000380	Resistor	MCR10EZHZ 1kΩ		
R6	7030000260	Resistor	MCR10EZHZ 100Ω		
R7	7030000400	Resistor	MCR10EZHZ 1.5kΩ		
R8	7030000540	Resistor	MCR10EZHZ 22kΩ		
R9	7030000620	Resistor	MCR10EZHZ 100kΩ		
R10	7030000500	Resistor	MCR10EZHZ 10kΩ		
R11	7030000420	Resistor	MCR10EZHZ 2.2kΩ		
R12	7030000420	Resistor	MCR10EZHZ 2.2kΩ		
R13	7030000700	Resistor	MCR10EZHZ 470kΩ		
R14	7030000500	Resistor	MCR10EZHZ 10kΩ		
R15	7030000500	Resistor	MCR10EZHZ 10kΩ		
R16	7030000380	Resistor	MCR10EZHZ 1kΩ		
R17	7030000380	Resistor	MCR10EZHZ 1kΩ		
R18	7030000380	Resistor	MCR10EZHZ 1kΩ		
C1	4030004750	Ceramic	C2012 JB 1H 103K-T-A		
C2	4030004700	Ceramic	C2012 SL 1H 391J-T-A		
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C4	4030004720	Ceramic	C2012 JB 1H 102K-T-A		

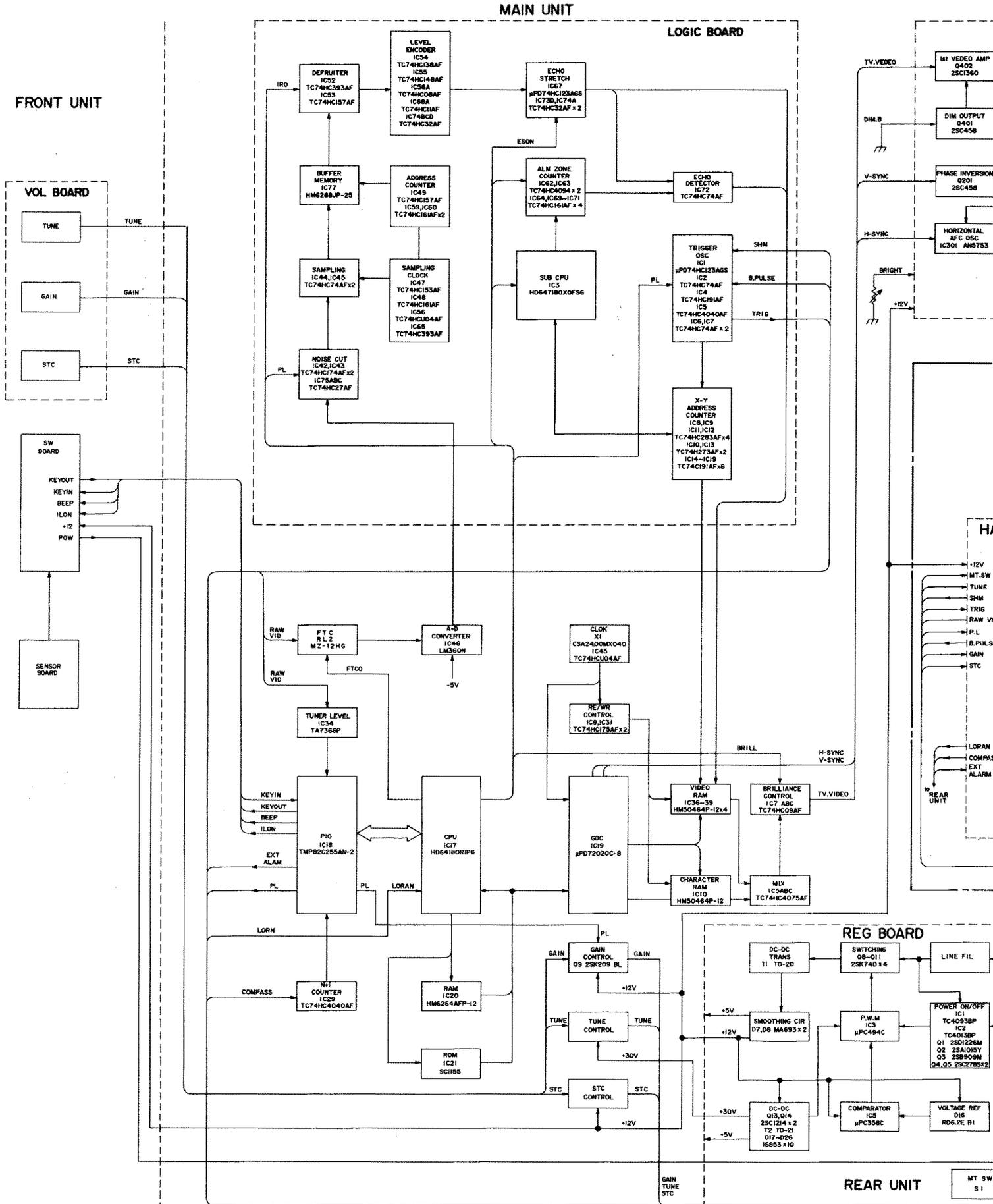
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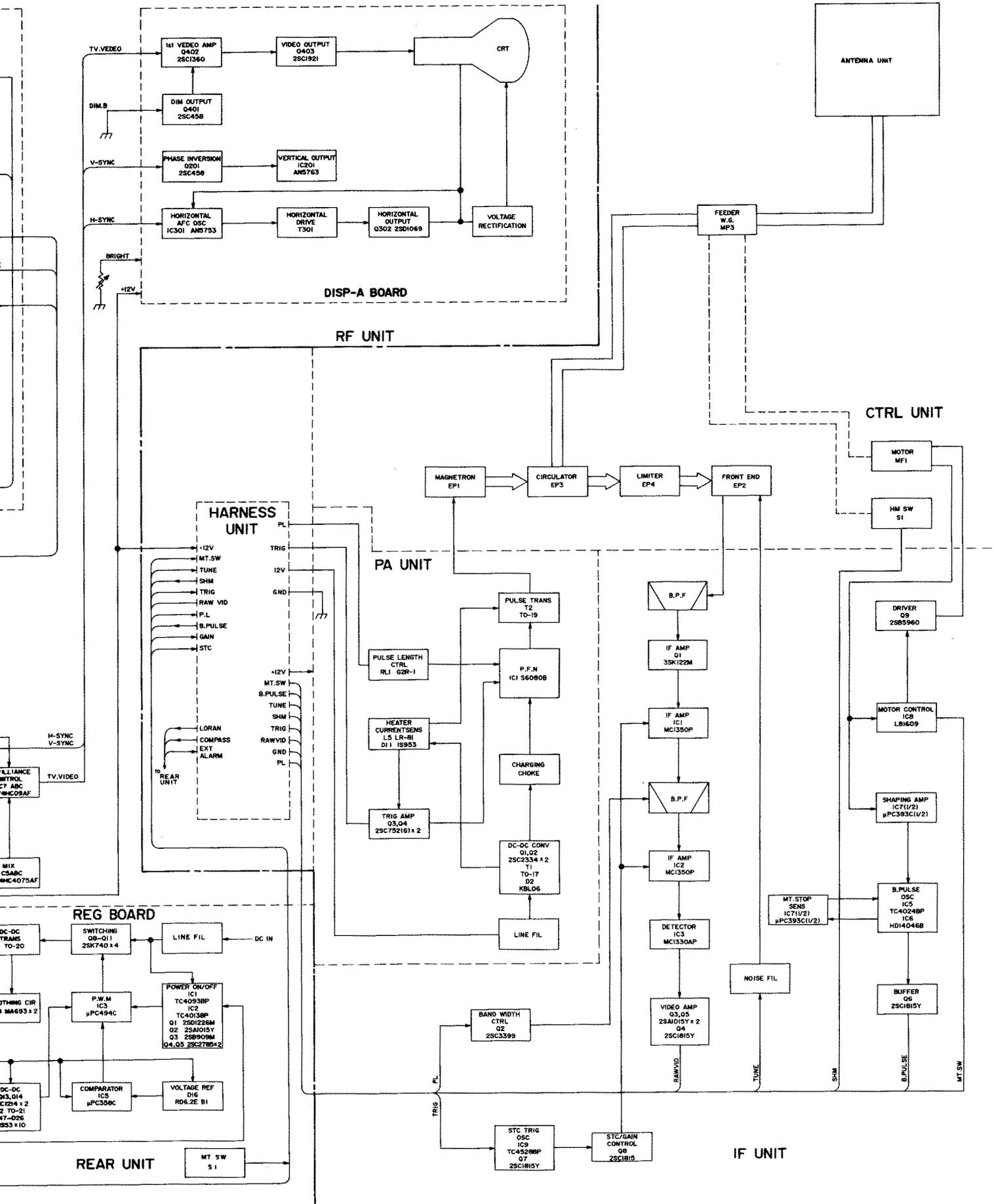
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C6	4550003160	Tantalum TEMSVD2 1C 336M-12L
C11	4030004710	Ceramic C2012 JB 1H 471K-T-A
C12	4030004710	Ceramic C2012 SL 1H 471K-T-A
C13	4030004520	Ceramic C2012 SL 1H 220J-T-A
C14	4030004520	Ceramic C2012 SL 1H 220J-T-A
C15	4030004470	Ceramic C2012 SL 1H 100D-T-A
C16	4030004610	Ceramic C2012 SL 1H 101J-T-A
C17	4030005110	Ceramic C2012 JB 1E 473K-T-A
C18	4030004520	Ceramic C2012 SL 1H 220J-T-A
C19	4030005030	Ceramic C2012 CH 1H 221J-T-A
C20	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C21	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C22	4030006450	Ceramic C2012 JF 1H 103Z-T-A
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C25	4030006450	Ceramic C2012 JF 1H 103Z-T-A
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C28	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C29	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C30	4030006450	Ceramic C2012 JF 1H 103Z-T-A
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C34	4030006450	Ceramic C2012 JF 1H 103Z-T-A
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C37	4030006450	Ceramic C2012 JF 1H 103Z-T-A
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C39	4030006450	Ceramic C2012 JF 1H 103Z-T-A
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C45	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C46	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C47	4030006450	Ceramic C2012 JF 1H 103Z-T-A
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C62	4030006450	Ceramic C2012 JF 1H 103Z-T-A
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C67	4030006450	Ceramic C2012 JF 1H 103Z-T-A
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C69	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C70	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C71	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C72	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C73	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C74	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C75	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C76	4030006450	Ceramic C2012 JF 1H 103Z-T-A
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C79	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C80	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C81	4030006450	Ceramic C2012 JF 1H 103Z-T-A
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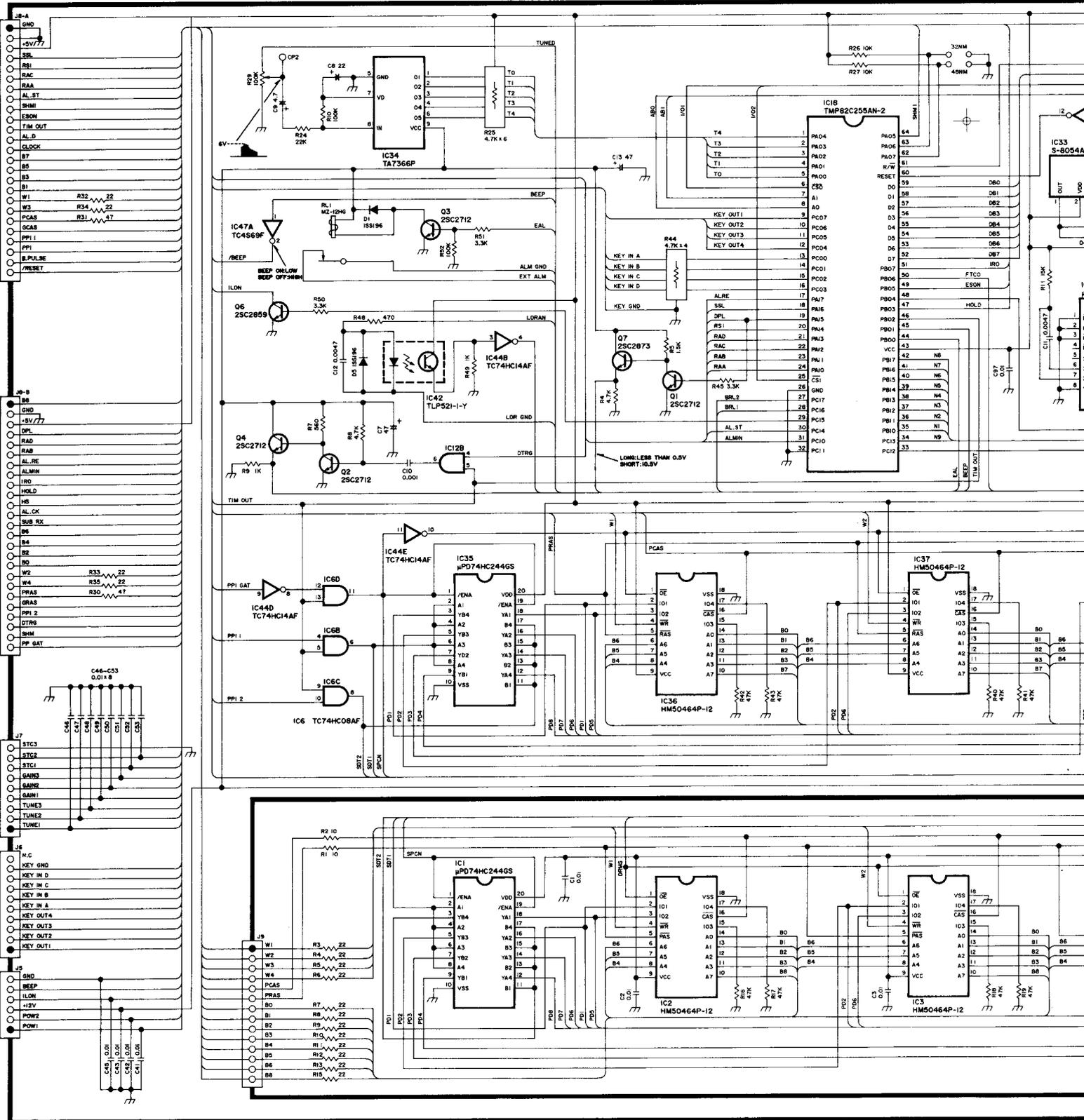
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C86	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C87	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C88	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C89	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C90	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C91	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C92	4030006450	Ceramic C2012 JF 1H 103Z-T-A
J1	6510012180	Connector XC5B-5021

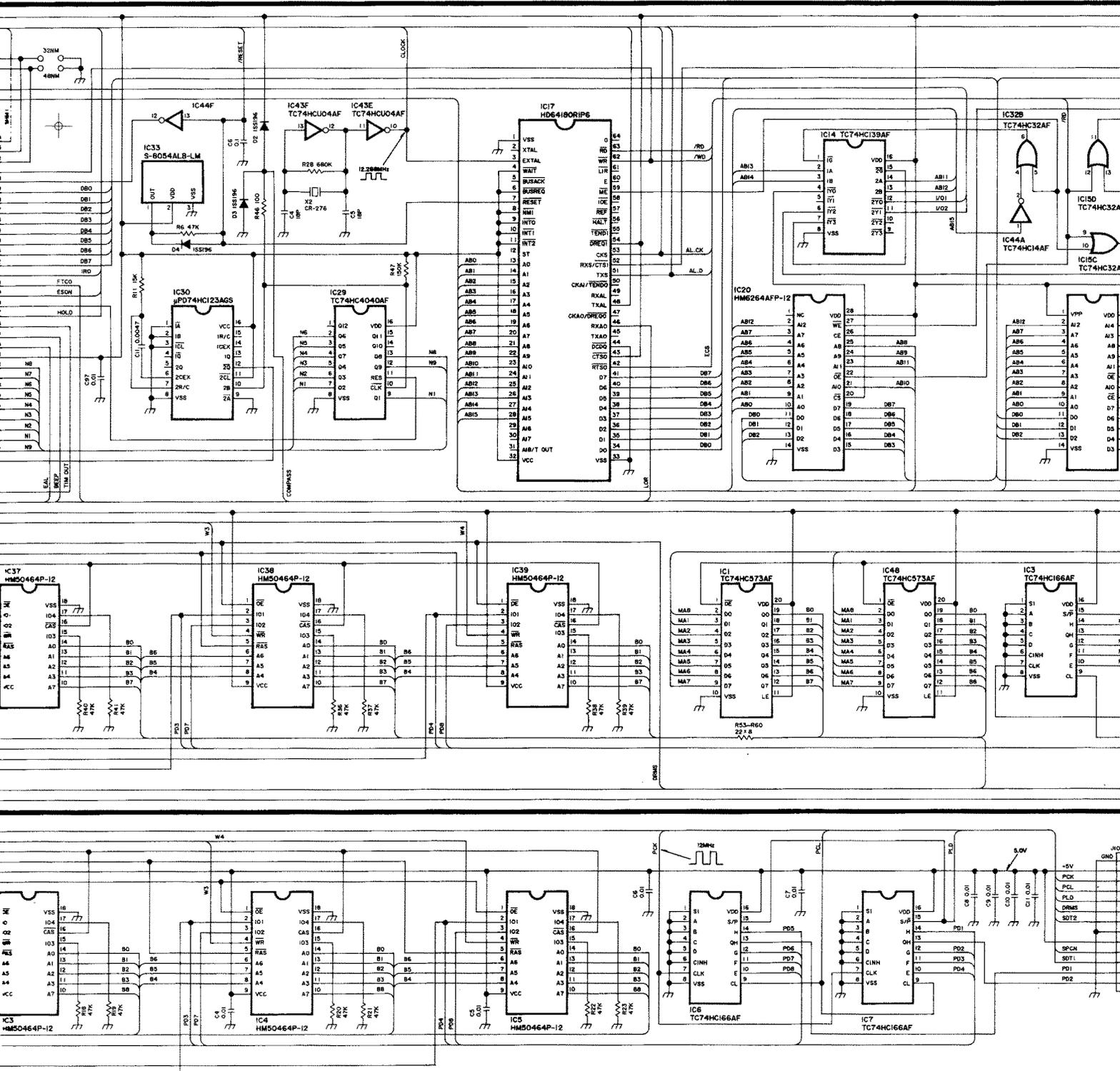
SECTION 11 BLOCK DIAGRAM



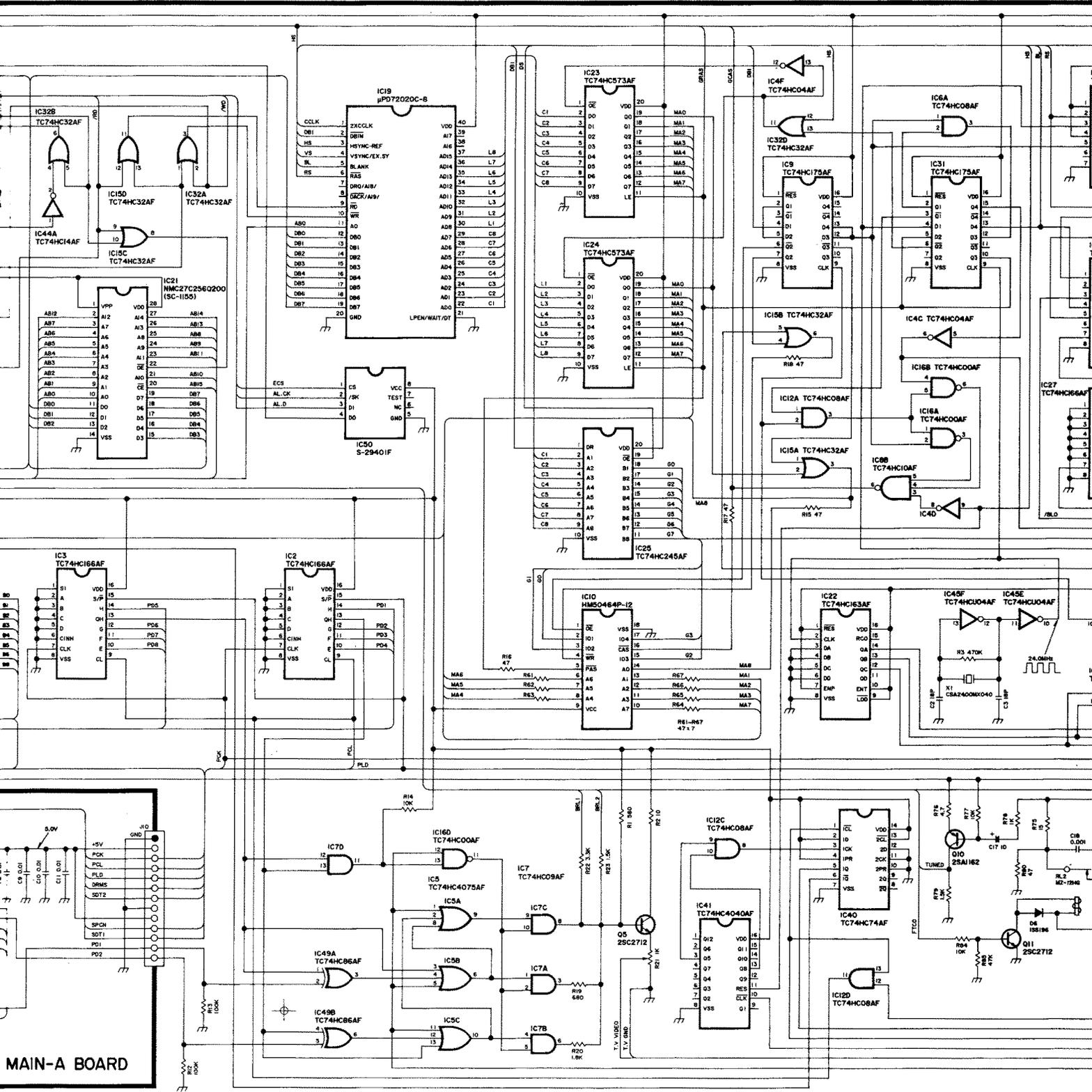


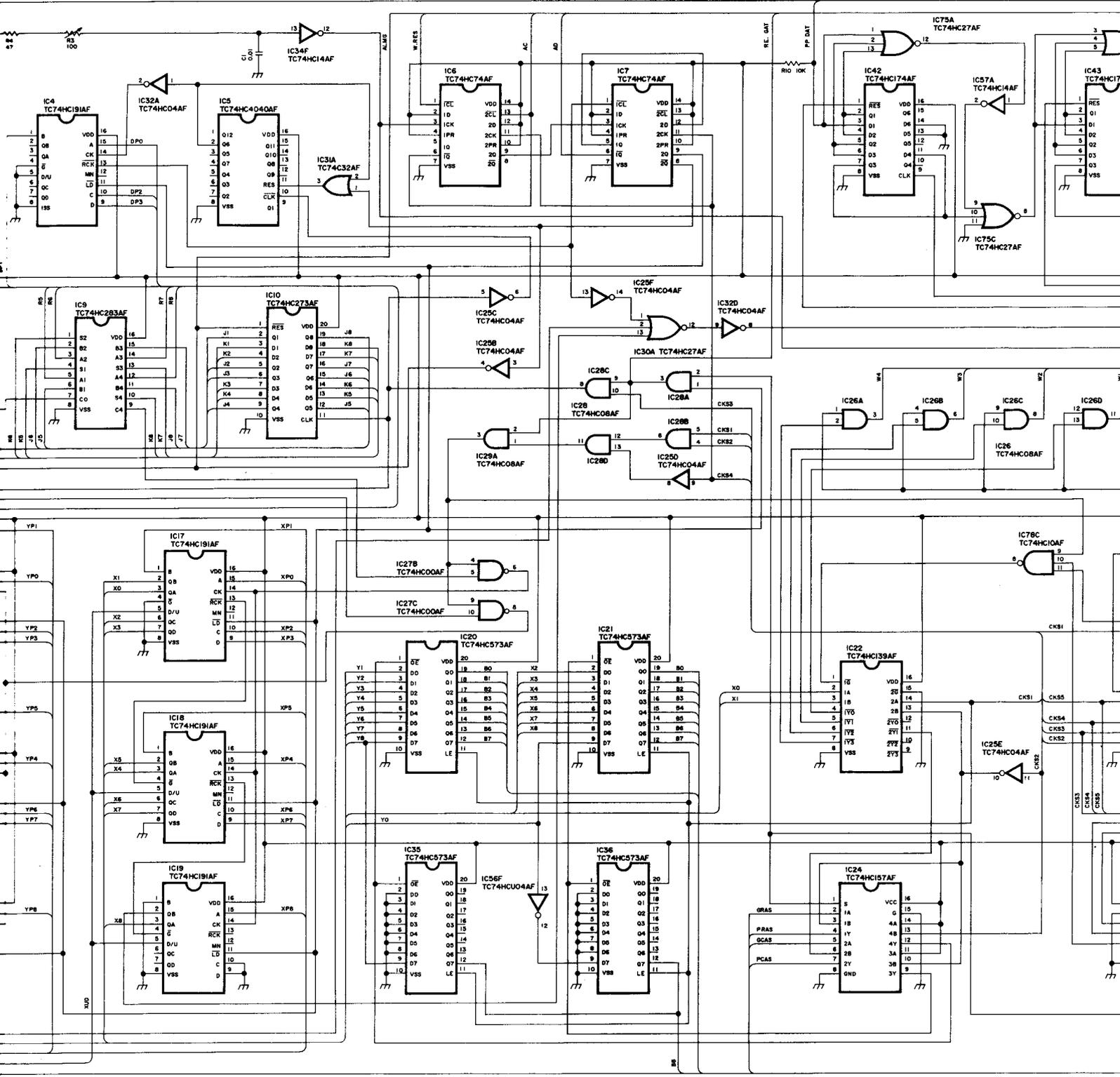
SECTION 12 VOLTAGE DIAGRAM

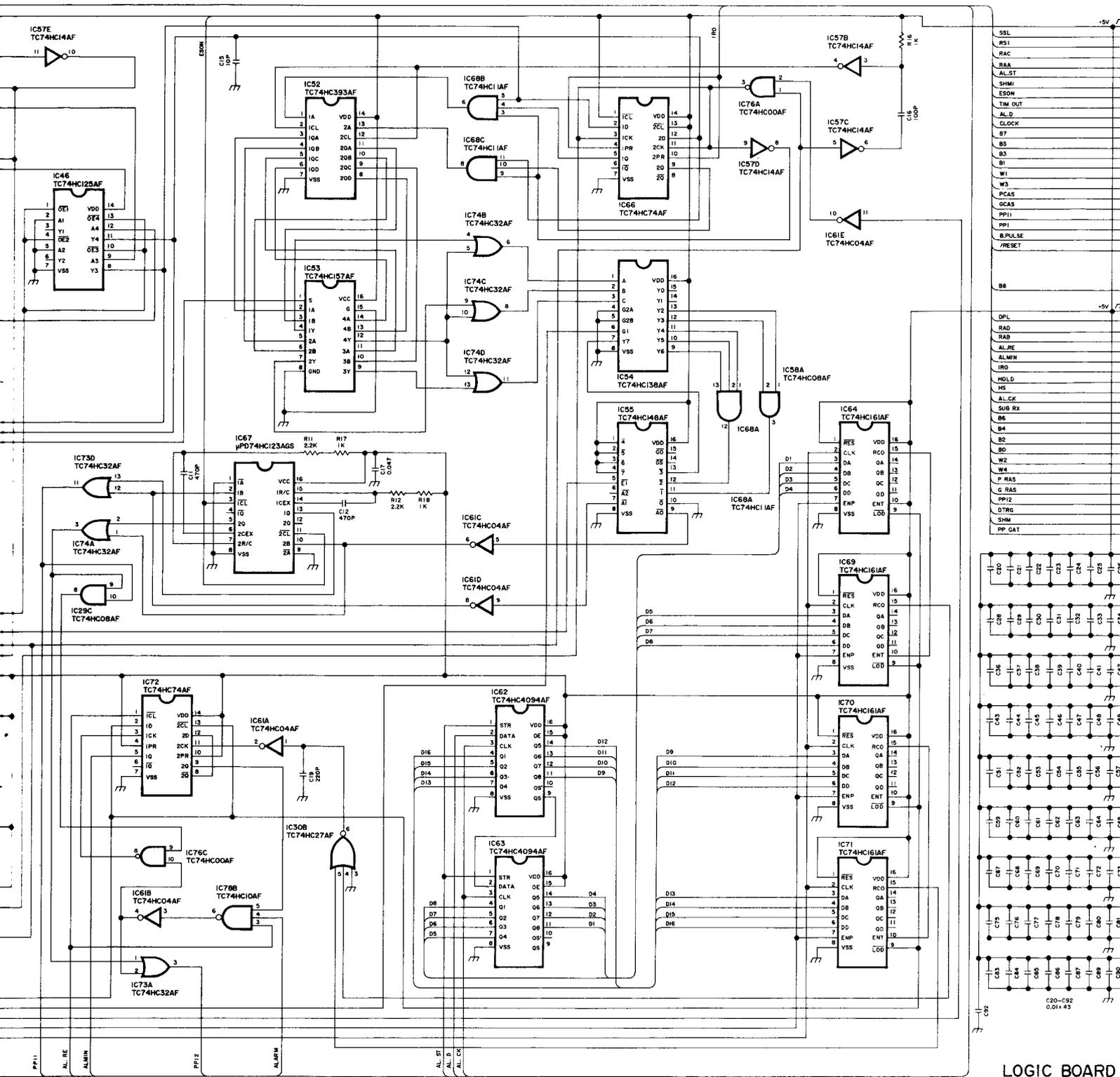




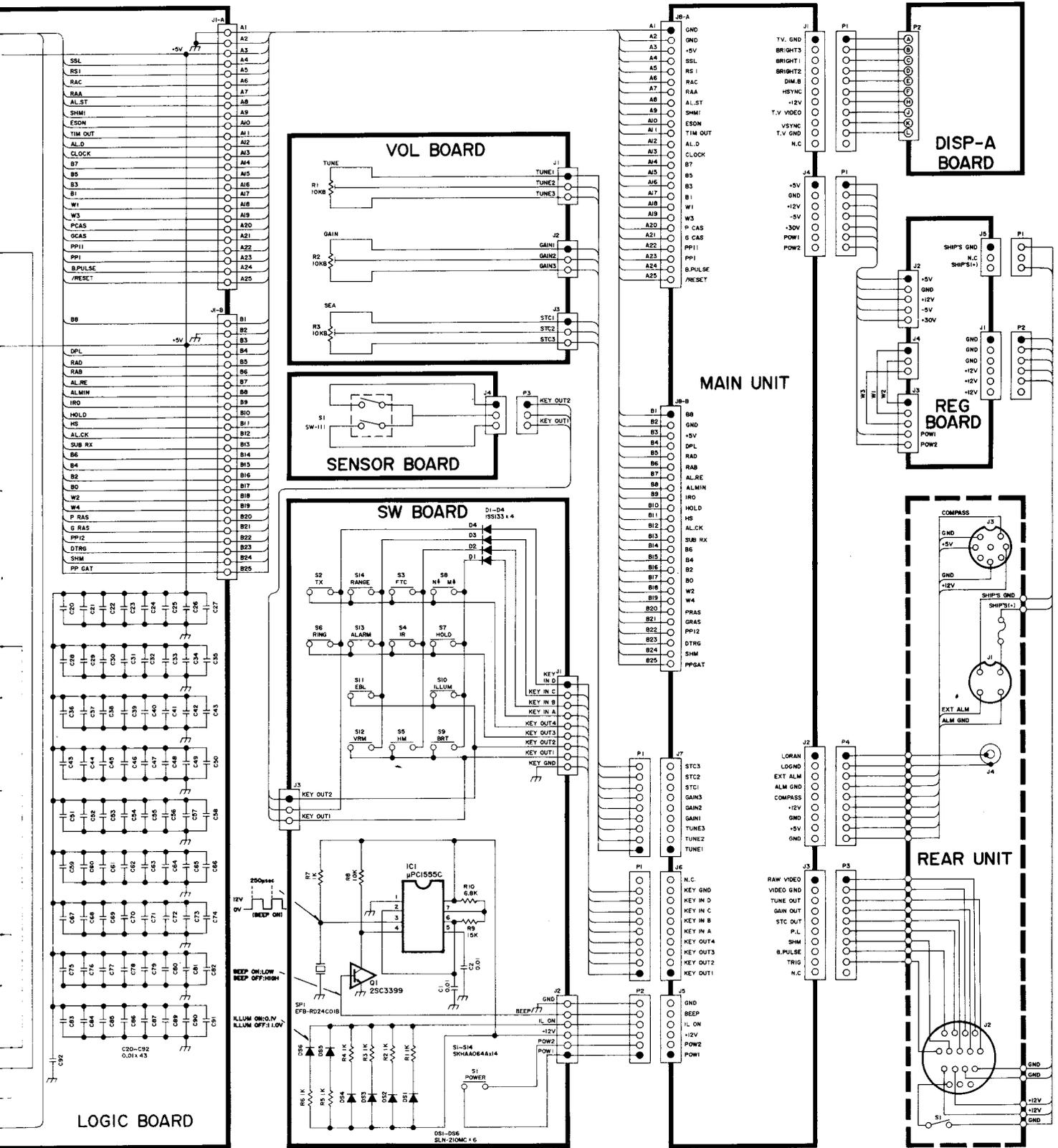
MAIN-A BOARD







SSL	RS1	RAC	RAA	ALST	SHMI	ESOM	TIM OUT	ALD	CLOCK	B7	B5	B3	B1	W1	W3	PCAS	GCAS	PP11	PP1	PPULSE	/RESET	B8	DPL	RAD	RAS	ALRE	ALMIN	ALRO	HOLD	HS	ALCK	SUB RA	B6	B4	B2	BD	W2	W4	P RAS	G RAS	PP12	OTRG	SHM	PP GAT	C30	C31	C32	C33	C34	C35	C36	C37	C38	C39	C40	C41	C42	C43	C44	C45	C46	C47	C48	C49	C50	C51	C52	C53	C54	C55	C56	C57	C58	C59	C60	C61	C62	C63	C64	C65	C66	C67	C68	C69	C70	C71	C72	C73	C74	C75	C76	C77	C78	C79	C80	C81	C82	C83	C84	C85	C86	C87	C88	C89	C90
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LOGIC BOARD

VOL BOARD

SENSOR BOARD

SW BOARD

MAIN UNIT

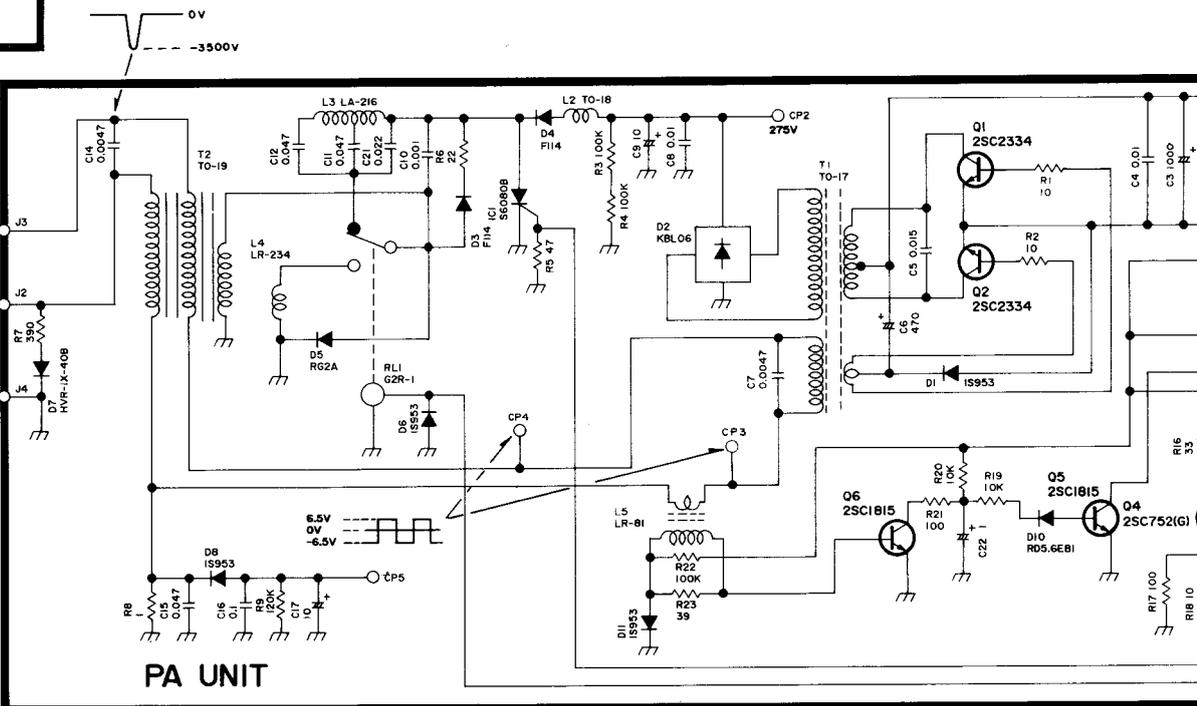
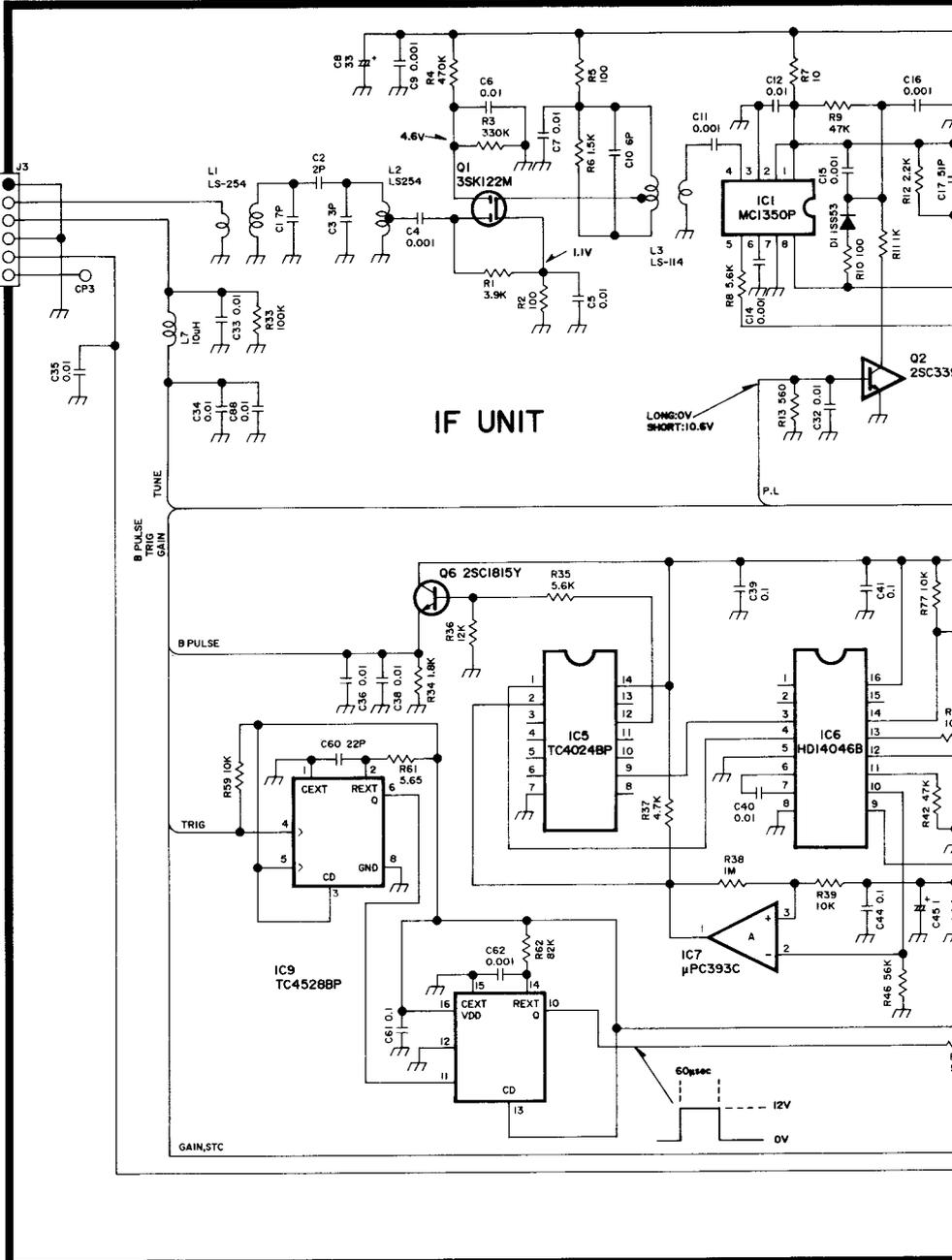
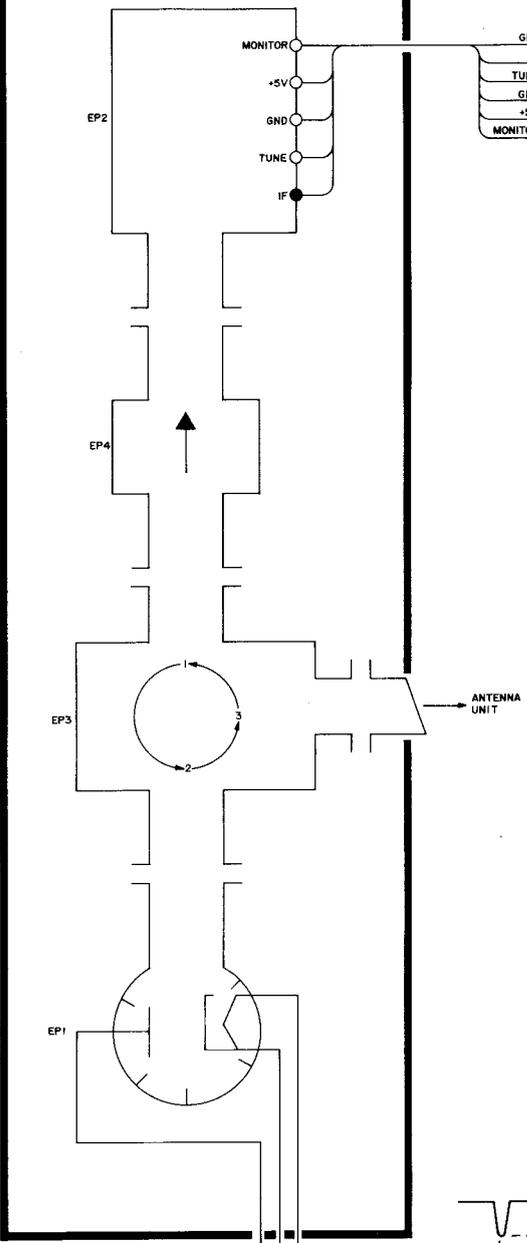
DISP-A BOARD

REG BOARD

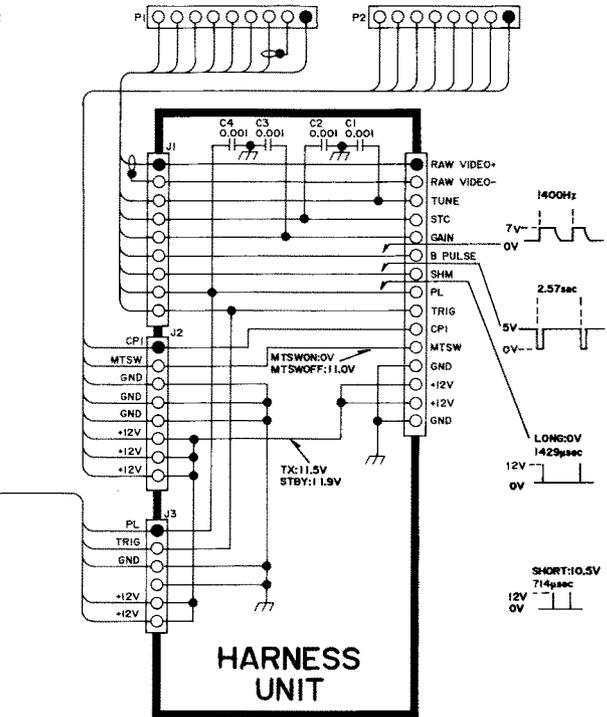
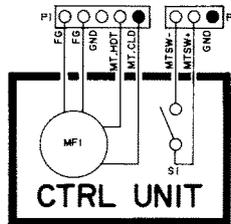
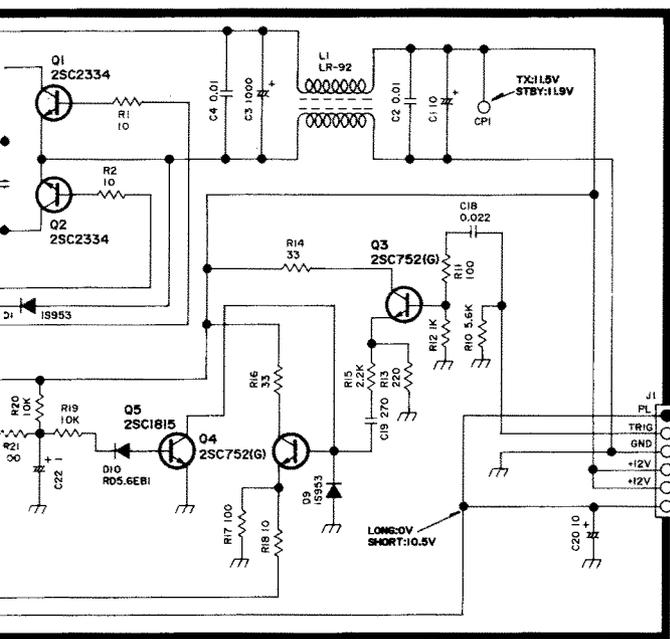
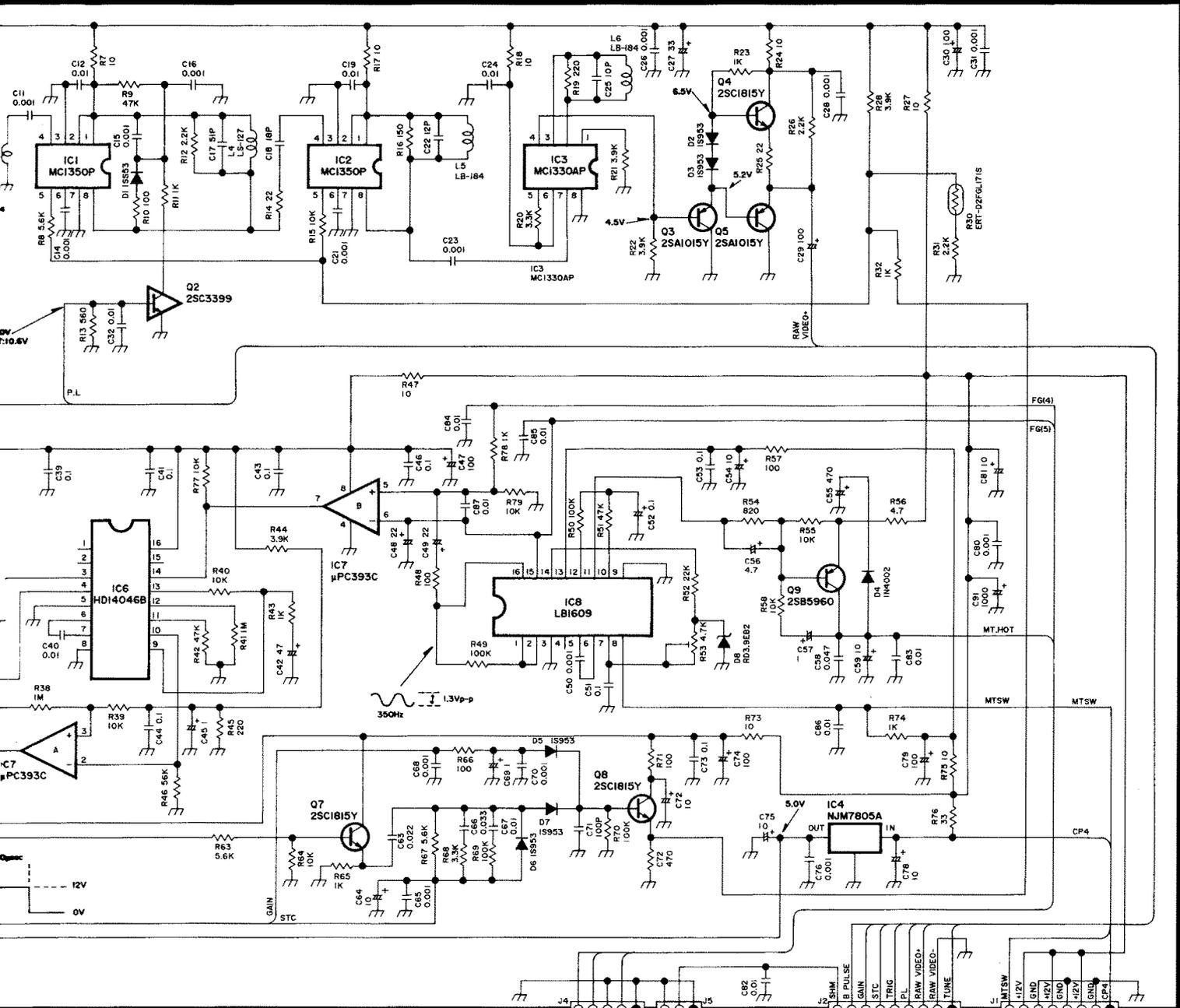
REAR UNIT

SCANNER

RF UNIT



PA UNIT



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